TO FLY AND FIGHT: THE EXPERIENCE OF AMERICAN AIRMEN IN SOUTHEAST ASIA

by

William F. Andrews
A Dissertation
Submitted to the
Graduate Faculty
of
George Mason University
in Partial Fulfillment of
The Requirements for the Degree
of
Doctor of Philosophy
History

Committee:

Director

Department Chairperson

Program Director

Dean, College of Humanities and Social Sciences

Date: April 6, 2011

Spring Semester 2011
George Mason University
Fairfax, VA

To Fly and Fight: The Experience of American Airmen in Southeast Asia

A dissertation submitted in partial fulfillment of the requirements for the degree of Doctor of Philosophy at George Mason University

By

William F. Andrews
Master of Arts
University of Alabama, 1994

Director: Christopher H. Hamner, Assistant Professor
Department of History and Art History

Spring Semester 2011
George Mason University
Fairfax, VA

Copyright: 2011 William F. Andrews
All Rights Reserved

DEDICATION

This is dedicated to John C. Andrews and Barbara L. Andrews, loving parents and grandparents to two generations of American warriors, and to Stacey W. Andrews the world's greatest fighter pilot wife.

ACKNOWLEDGEMENTS

I am indebted to many energetic and helpful colleagues who played key and indispensible roles in helping make this work a reality. I would like to first thank Christopher Hamner, my dissertation advisor, for his patient and relentless encouragement of my thinking and my writing. I will long treasure our many wide-ranging discussions of war, warriors, and history. Likewise, through our readings and informal chats over coffee, Meredith Lair greatly expanded my thinking on Vietnam, war and society, and encouraged me to pursue precision in my writing. The thoughtful comments and suggestions from the other members of my dissertation committee, Mark Clodfelter and Zachary Schrag, greatly expanded my perspectives, and helped me sharpen the focus of this paper, and I am in their debt. I feel fortunate to have been mentored by Alison Landsberg and Rosemarie Zagarri through a pair of readings courses, which they carefully crafted, to greatly expand my perspectives on American history, and historiography.

I would also like to thank the staff of the National Defense University Library, especially Kimberley Jordan, Crafton Hayes, Mary Bowser, Liz Harrison, and Carolyn Turner for their tireless and indispensible support. It seemed that no resource was beyond the library staff's grasp. Many friends and colleagues, including Lani Kass, Brig Gen Kurt Neubauer, and Cols Bart Weed, Bob Colella, Carl Farquhar, and Tom Ehrhard, encouraged me and helped push my thinking on warriors and war in the air. Steve Randolph helped me brainstorm an idea that became the heart of this dissertation. I must also thank Alan Gropman, Tommy Towery, and Darrel Whitcomb, veterans of the war over Southeast Asia who provided me with refined observations from men who were there. I am fortunate to have learned from the generation of Air Force airmen who fought in the skies of Vietnam. They taught me about flying and fighting from my first days as a cadet in 1976, through 1991, when that generation, as general officers, directed an air war (that I flew in) without many of the flaws they suffered through as junior officers.

I cannot express enough appreciation for my wife, Stacey, who painstakingly entered every airplane lost over Southeast Asia into a database that served as an indispensible analytical tool in this project. She then proofread the paper while cutting me a lot of slack around the house as I commandeered the dining room table over countless nights and weekends for two years. Without her unbounded love and unflagging support, this mission would never have gotten off the ground.

.

TABLE OF CONTENTS

Page
List of Figures……....vii
Abstract.....……viii

Introduction
Chapter 1: Air Force Aviators and the War over Southeast Asia .....…1
Chapter 2: Forging a Generation of Airmen 22

Case One: Rolling Thunder
Chapter 3: Operation Rolling Thunder 61
Chapter 4: Risk and the Fight for Air Superiority 118
Chapter 5: Motivation in Rolling Thunder 165

Case Two: The In Country Air War
Chapter 6: Tactical Airlift and the In Country Air War.....200
Chapter 7: The Forward Air Controllers.....266
Chapter 8: Operation Arc Light 320

Case Three: Commando Hunt
Chapter 9: Fighters in Operation Commando Hunt.....394
Chapter 10: Gunships in Commando Hunt.....465
Chapter 11: Rescue in Southeast Asia 507

Conclusion
Chapter 12: Conclusion: Technology, Motivation, and War in the Air.…....553

Appendices.....568
List of References.....570

LIST OF FIGURES

Figure Page
Route Packages: North Vietnam 100

ABSTRACT

TO FLY AND FIGHT: THE EXPERIENCE OF AMERICAN AIRMEN IN SOUTHEAST ASIA

William F. Andrews, PhD

George Mason University, 2011

Dissertation Director: Dr. Christopher H. Hamner

How did U.S. Air Force aviators, a well-trained cohort of volunteers, experience combat in Southeast Asia, and what motivated them to strap into high performance jet fighters, multiengine bombers and transports, or tiny spotter airplanes and fly into harm's way? This dissertation argues that throughout the war, an affinity for the power, control, and freedom of military aviation provided a central core of internal motivation. These basic attractions of military aviation, and a set of closely-related corollaries including obligation, flying excellence, competition, and honor tied these aerial warriors to larger external groups, providing further motivation for combat flying. To operate powerful technology was intrinsically satisfying to these men, but controlling that power obligated them to help fellow combatants to fight, win, and live to fight another day. Changing American strategies, technologies, and domestic attitudes altered the motivational landscape throughout the war, but these major sources of combat motivation endured, although subtle shifts in their relative prominence and availability followed changes in the technological and strategic environment.

Air Force Aviators and the War over Southeast Asia

November 1967 was one of the toughest months of the war over Southeast Asia for American aviators. Operation Rolling Thunder, the United States air campaign against Hanoi was in its third year, and although Air Force and Naval aviators had employed America's most advanced military technology against the North Vietnamese for thirty-two arduous months, they had not broken the will of its political leaders or Air Defense Command. Unknown to the American aviators, North Vietnamese radar operators discovered a method to lock onto American radar jamming, and over four grim November days, volleys of telephone pole-sized surface-to-air missiles knocked down ten American jets—the worst stretch of the war to date. North Vietnam's fighter pilots, in their Soviet-built MiG fighters out-fought American fighter pilots and shot down six American fighters at the cost of two of their own through recently developed high-speed hit and run tactics. By the end of the month, Vietnamese air defenses and operational accidents claimed fifty-five American aircraft across the theater, including an F-105 piloted by Colonel Ed Burdette, the 388th Tactical Fighter Wing's popular commander, shot down in flames over North Vietnam on November 18, 1967. Despite the loss of their commander, F-105 pilots from the Thailand-based 388th wing returned to the skies over Hanoi the following day, ran a gauntlet of ninety-three surface-to-air missiles, and struck their assigned targets. In recognition of extraordinary heroism displayed under such dangerous conditions, three 388th pilots earned the

Air Force Cross—the nation's second highest decoration—for bravery in leading attacks and supporting comrades attempting to fly stricken aircraft to safety.[1]

Concurrently, about four hundred and fifty miles south of Hanoi, other American airmen engaged in forms of combat that appeared very different: they operated far more vulnerable aircraft in support of the war in South Vietnam, executed different types of missions, and faced different dangers. As F-105 pilots returned to the skies over Hanoi on November 19, two battalions of US paratroopers struggled to seize a hilltop near the South Vietnamese town of Dak To; the fighting was so bitter that the battalions suffered twenty percent casualties in just three days. Day and night, Air Force pilots, trained as forward air controllers, orbited over the battlefield for three or more hours at a time, directing relays of Air Force, Navy, and Marine fighters against battalions of entrenched North Vietnamese regulars.[2] Emotions ran so high in the battles around Dak To, that one forward air controller (who would also earn the Air Force Cross that November) knocked out a North Vietnamese heavy machine gun position with his assault rifle from the open window of his tiny, unarmored spotter plane.[3] As the fighters and forward air

---

[1] Wayne Thompson, *To Hanoi and Back: The United States Air Force and North Vietnam, 1966-1973* (Washington, DC: Smithsonian Institution Press, 2000), 103-105; Chris Hobson, *Vietnam Air Losses: United States Air Force, Navy and Marine Corps Fixed-Wing Aircraft Losses in Southeast Asia 1961-1973* (Hinckley, England: Midland, 2001), 124-127; Robert Frank Futrell et al., *Aces & Aerial Victories: The United States Air Force in Southeast Asia, 1965-1973* (Maxwell Air Force Base, AL: Albert F. Simpson Historical Research Center, Air University, 1976), 121; Robert W. Smith, "Robert W. Smith Autobiography," *NF104: Birth of a Spaceplane*, accessed January 20, 2009, http://www.nf104.com/ab/index.html; Merle L. Pribbenow, "The -Ology War: Technology and Ideology in the Vietnamese Defense of Hanoi, 1967," *The Journal of Military History* 67, no. 1 (January 2003): 198.

[2] The fighting was so close that an errant bomb dropped by a Marine fighter struck an Army company command group, inflicting forty-two killed and forty-five wounded. C. William Thorndale, *Battle for DAK TO*, CHECO Contemporary Historical Evaluation of Combat Operations, June 21, 1968, 13, Air Force Historical Research Agency, Maxwell AFB, AL.

[3] Lt Col Joseph B. Madden, interview by Lt Col V. H. Gallacher and Maj Lyn R. Officer, February 7, 1973, 18, Air Force Historical Research Agency, Maxwell AFB, AL.

controllers swirled along the ridgelines surrounding Dak To, other airmen flew large crew-operated aircraft into the battle. Big four-engine C-130 transports skirted in and out of a rough airstrip on the valley floor, hauling in supplies and evacuating the dead and wounded. Vietnamese mortars found their mark on November 15, and destroyed a pair of the big C-130s loading and unloading at Dak To. A third C-130 escaped destruction through the efforts of an intrepid C-130 pilot and loadmaster, who ran to the aircraft, started it, and backed it away from the growing inferno on the parking ramp.[4] In the thin, cold, air seven miles above the fires of Dak To, Air Force B-52 bombers blanketed the distant hills west of the town with thirty-ton payloads of high explosives. Detached from the heated action unfolding at treetop height, the high-flying bomber crews carried out their bomb-runs under precise radar direction from American controllers on the ground, and then turned towards their air base on Guam, twenty-five hundred miles distant, fighting the bone-wearying exhaustion that accompanied their fourteen hour globe-spanning missions.

This dissertation examines the diverse range of combat experienced by U.S. Air Force aviators to identify the underlining motivations that led them to fly and fight in a war over Southeast Asia.[5] Airmen carried out a wide range of missions, faced many dangers, and enjoyed

---

[4] Ray L. Bowers, *Tactical Airlift*, The United States Air Force in Southeast Asia (Washington, DC: Office of Air Force History, United States Air Force, 1983), 286; Warren A. Trest, *Khe Sanh (Operation Niagara) Vol. 1*, CHECO Contemporary Historical Evaluation of Combat Operations, September 13, 1968, 8, Air Force Historical Research Agency, Maxwell AFB, AL.

[5] All four services conducted flight operations in Vietnam. Army and Marine aviators flew primarily in support of their ground elements; Navy fliers operated as small cohesive squadrons from aircraft carriers primarily over the North. This dissertation examines Air Force crews, who covered the breadth of the theater, flying in support of the ground forces, operating independently against North Vietnam, and operating in small cohesive squadrons, close-knit crews, and also as individual replacements, which lends the broadest range of experiences of all the services for this dissertation.

different degrees of autonomy as American strategies and attitudes towards the war shifted, military technologies evolved, and the rules governing combat expanded and contracted through the war. The F-105 pilots who dive-bombed targets in downtown Hanoi, for example, experienced combat differently than crews operating high-flying B-52s against the jungle hinterlands around Dak To. Pilot Robert Rilling completed one hundred missions in both the F-105 and the B-52, and noted many differences. When "you're more or less fighting for your life" as in the F-105, "you stay interested without any problem, where when you get hours and hours plugging away [as in the B-52] and yet you have to get a high level of efficiency…it's difficult to do." To Rilling, a great fear in the bomber was the consequences of missing the target. "The crew constantly cross checks to avoid" fratricide, which "is our biggest fear. I think every crew is scared to death that they may make a slip now and drop in the wrong place." Although Air Force policy ruled no flier would have to serve two tours in Southeast Asia until all had gone once, Rilling volunteered for both combat tours, out of a love of flying and a desire to continually improve his skills as a military aviator. "I think there's a need for people that like to fly and like the work" Flying is "a job that I think I do well, and I would like to stay in it."[6] Like Rilling, thousands of Air Force aviators volunteered for Southeast Asia, encountered a diverse range of combat, and were driven by a common core of internal motivations founded on their love of flying.

This dissertation describes a cohort of volunteers who derived excitement and internal satisfaction from flying in combat over Southeast Asia. American popular memories of Vietnam

---

[6] Lt Col Robert G. Rilling, interview by Gene Plunkett, August 25, 1968, 35, 37, Air Force Historical Research Agency, Maxwell AFB, AL.

elevate the experiences of working class "grunts" (infantrymen) pressed into difficult, bloody, and frightful service in Vietnam's steaming jungles. Common perceptions captured by works such as Christian Appy's *Working-Class War: American Combat Soldiers and Vietnam* contend the draft pulled young men heavily from working-class and ethnic minorities, and sent them to fight an unpopular war. Brutalized in basic training, and sent to war with minimal or conflicting guidance in support of a "doctrine of atrocity," these soldiers suffered from poor leadership, weak discipline, and were indiscriminate in their use of violence.[7] By enduring common hardships, these men formed close personal bonds within their squads and fought primarily for each other as a so-called "band of brothers."

Such images of afflicted grunts as the iconic Vietnam veteran are so pervasive in American collective memory that Vince Osborne, an Air Force electronic warfare officer who flew multiple tours over Southeast Asia in a B-52, felt so distant from the hardships and suffering of Vietnam's jungles he later wondered if he could even be considered a Vietnam veteran. "I often ponder if I am a Vietnam veteran in the true sense of those words? I see the war footage and I know I didn't have it as tough as those who fought close combat in the jungles. I was also lucky that I never saw any of my friends or fellow fliers blown up. In my crew compartment as an electronic warfare officer on the B-52, I was surrounded by racks of electronic equipment and didn't even have a window to the outside world."[8] As an officer and aviator, insulated from the jungle fighting by technology, Osborne's war *was* different from the grunt's. He was part of a

---

[7] Christian G. Appy, *Working-Class War: American Combat Soldiers and Vietnam* (Chapel Hill: University of North Carolina Press, 1993), 201.

[8] Vince Osborne, "Linebacker II--A Personal View," in *We Were Crewdogs - The Vietnam Collection*, ed. Tommy Towery (Memphis, TN: Tommy Towery, 2008), 167.

military elite, comprised of men who volunteered for flying duty, and after an initial five-year service obligation, could leave the service. They were well-trained, highly skilled, and predominantly officers. Aviation and electronics technologies defined many aspects of Osborne's combat experience and distanced him and his peers from the grunts. As an ever greater portion of twenty-first century military power is derived from technology-intensive systems operated by long-serving military professionals, the forces that motivated Osborne and the cohort of airmen who fought in a series of increasingly high-tech campaigns in Southeast Asia become increasingly relevant.

The historiographical context on combat motivation has been long dominated by the belief that group cohesion pressures soldiers to perform tasks they would not want to do otherwise. That concept, concerned primarily with the experiences of soldiers on the ground, identifies a thread of popular orthodoxy and revisionist challenges that are relevant to the experiences of airmen. The contemporary debate on combat motivation extends back to at least the Second World War when social scientists and historians tried to understand why individuals fought.[9] Sociologists Edward Shils and Morris Janowitz authored the landmark "Cohesion and Disintegration in the Wehrmacht in World War II" in 1948 based on their interviews with German prisoners. They argued an individual's relationship to his primary group—close

---

[9] Dating back to antiquity, reflective military officers wrote observations on combat motivation in order to reform military policies or to advise fellow military practitioners. In one of the most important studies, French Colonel Charles Ardant du Picq authored *Battle Studies* in 1868 as a systematic examination of combat motivation for fellow military practitioners in response to the growing tactical dilemmas of the era. The contemporary American debate was primed by the attention of social scientists seeking scientific improvements in the era of mass mechanization, mass mobilization, and the Second World War. See Charles Ardant du Picq, *Battle Studies: Ancient and Modern Battle*, trans. John Nesmith Greely and Robert Christie Cotton (New York: The Macmillan Company, 1921); Samuel Andrew Stouffer, ed., *The American Soldier*, Studies in Social Psychology in World War II (Princeton: Princeton University Press, 1949).

associates within combat units—was the main factor whether he fought or surrendered. At the same time, U.S. Army Colonel S.L.A. Marshall, a former journalist, published the short but influential *Men Against Fire* in 1947 summarizing his views formed as a battlefield historian. Marshall argued that primary groups were the most important motivator for American GIs. "An ideal does not become tangible at the moment of firing a volley or charging a hill. When the hard and momentary choice is life or death, the words once heard at an orientation lecture are clean forgotten, but the presence of a well-loved comrade is unforgettable."[10] Since World War II, the primary group has played a dominant role in American understanding of combat motivation and constitutes the conventional wisdom in military and popular circles, mirrored in American movies and literature. This position was most directly stated in a prominent scene in the 2002 movie *Black Hawk Down*, which features a conversation between two American soldiers preparing to return to battle. "People ask me, why do you do it?" muses a Special Forces soldier. His reply: "they won't understand it's all about the man next to you and that's it. That's all there is."[11]

Subsequent scholarship has posed alternatives to the primary group's preeminent role in combat motivation. Sociologist Anthony Kellett's 1982 study, *Combat Motivation,* identifies several powerful motivating factors beyond the primary group. As a corrective to Marshall and others, Kellett argues that primary group cohesion is important, but insufficient to ensure the

---

[10] S. L. A. Marshall, *Men Against Fire; the Problem of Battle Command in Future War* (Washington DC: Infantry Journal, 1947), 161.

[11] This conversation, which furthers popular notions on combat motivation, appears to be a cinematic creation by Ridley Scott and the movie's screenwriters, and is absent in the book by Mark Bowden that served as a basis for the movie. The nearest conversation in Bowden's book took place between different figures and presents a different perspective on motivation, emphasizing duty and obligation rather than peer bonds: "I know you're scared. I'm scared shitless. I've never been in a situation like this either. But we've got to go. It's our job." Mark Bowden, *Black Hawk down: A Story of Modern War* (New York: Atlantic Monthly Press, 1999), 160; Ridley Scott, *Black Hawk Down*, DVD (Sony Pictures, 2002).

success of a mission. He proposes a range of factors, beyond the primary group, that include leadership, discipline, training, unit pride, and ideology which play important, but varying roles in a soldier's will to fight.[12] After Kellett, a cohort of military historians published arguments proposing ideology, leaders, and culture as predominant combat motivators at different times and places that have eroded the primary group's primacy in some circles.[13]

Some close-knit Air Force squadrons and the crews of some large aircraft constituted cohesive primary groups, but social cohesion was not the most powerful or most pervasive motivator for airmen in Southeast Asia. As already noted, a love of flying was the most common basis for an airmen's motivation in Vietnam and served as a foundation for a range of closely related secondary motivations. Several scholars have focused on the combat aviator's motivations and identify several motivational factors relevant to the experiences of American airmen in Southeast Asia. They pose three general sources of motivation: internal motivators tied to personal preferences and values; close external motivators such as primary groups and unit leaders; and third, more distant external motivators that include affiliations with groups larger than the primary group or association with a collective culture.

---

[12] Anthony Kellett, *Combat Motivation: The Behavior of Soldiers in Battle*, International Series in Management Science/Operations Research (Boston: Kluwer-Nijhoff Pub, 1982).

[13] Several prominent arguments feature a range of key motivators. Omer Bartov stresses ideology, and Stephen Fritz argues for collective culture as predominant motivators within the German Wehrmacht in World War II. John Dower argues racism dominated World War II in the Pacific. Nora Stewart argues small unit leadership was critical in the Falklands, and John Lynn identifies national culture as a primary motivator. See Omer Bartov, *Hitler's Army: Soldiers, Nazis, and War in the Third Reich* (New York: Oxford University Press, 1991); John Dower, *War Without Mercy: Race and Power in the Pacific War* (New York: Pantheon, 1986); Stephen G. Fritz, *Frontsoldaten: The German Soldier in World War II* (Lexington: University Press of Kentucky, 1995); John A. Lynn, *Battle: A History of Combat and Culture* (Boulder: Westview Press, 2003); Nora Kinzer Stewart, *Mates and Muchachos: Unit Cohesion in the Falklands/Malvinas War* (Washington: Brassey's Inc, 1991).

Mark Wells' groundbreaking *Courage and Air Warfare* examines the stresses endured by Royal Air Force and Eighth Air Force bomber crews over Germany in World War II (many of these American bomber pilots subsequently served as commanders in Southeast Asia). Wells describes an abundance of young Americans ready to volunteer for flying duties, but the very deadly skies they encountered over Germany posed substantial motivational challenges as losses exceeded 50 per cent and eighty-one thousand allied airmen died in European skies. He expertly identifies "scores" of "interrelated factors which kept men motivated," but places social cohesion and leadership most prominently in his findings. "The truth is their motivations to combat had less to do with patriotism and glorified self-image than it did to their unwillingness to let their buddies down and their desire to get on with their jobs." Wells also argues that "leadership provided much of the day-to-day external support for staying in combat" and was the "keystone upon which any fighting unit was built." [14]

John Darrell Sherwood published a trio of books on Air Force and Naval aviators in Korea and Vietnam. His most relevant work to this study, *Fast Movers: Jet Pilots and the Vietnam Experience* examines Air Force and Naval Aviators in Southeast Asia and features internal and distant external motivators most prominently. Sherwood argues that jet pilots from all services fought out of pride in their service, their units, and to secure their membership in a collective "fast mover" culture shared by jet fighter crews. Members ascribing to this group culture appreciated the challenge of war as an individual opportunity to test and affirm one's individual flying skills to satisfy their internal preferences, but its members also valued their

---

[14] Mark K. Wells, *Courage and Air Warfare: The Allied Aircrew Experience in the Second World War* (London: Frank Cass, 1995), 2, 93, 95, 137.

standing in an elite profession of jet fighter crews, united as a like-minded and driven success-oriented group.[15]

John Zentner proposes a third alternative, arguing that satisfaction of individual psychological needs surpass distant external allegiances (esprit) or local external allegiances (unit cohesion). His comparative study of American and German fighter pilots in World War II and B-52 bomber crews in Southeast Asia finds individual confidence in one's aircraft, training, and the ability to exercise control over tactics was most important to combat aviators. He further argues combat leaders best bolster aircrew morale by encouraging innovation, thus allowing crews to exert maximum control over their situation in combat. Zentner argues that the group cohesion elevated by Wells was present only within the six-man bomber crews he studied, but "for airmen…cohesion hardly matters at all." He further finds that higher allegiances to a collective identity favored by Sherwood were present in some units but did not contribute to aircrew morale.[16]

This dissertation argues that USAF aviators were affected by all three, but driven primarily by an internal desire to fly military aircraft, which was supplemented by their desire to prove themselves to other aviators, and a sense of duty and obligation to use the unique and considerable power of their aircraft to aid larger external communities of fellow combatants on the ground and in the air. The thrilling potential of flight, the aesthetics of sleek and powerful military aircraft, and World War II's inspirational heroic aviator imagery led many young men of

---

[15] John Darrell Sherwood, *Fast Movers: America's Jet Pilots and the Vietnam Experience* (New York: Free Press, 2000), xvii.

[16] Zentner made morale the subject of his study, and saw motivation "embedded in the concept of morale." Lt Col John J. Zentner, *The Art of Wing Leadership and Aircrew Morale in Combat*, CADRE Paper 11 (Maxwell Air Force Base, AL: Air University Press, 2001), 13, 95-100.

the Vietnam-generation to military aviation. There, basic flight training and Air Force's distinctive aviation sub-cultures (dividing fighters, bombers, and cargo aircraft) powerfully molded their pre-existing internal motivations into an obsessive passion for flying and introduced them to a group culture founded on performance, competition, and winning.

An airman's affinity for flying was founded on three intrinsic appeals of military aviation: power, control, and freedom, which provided a powerful stimulus to fly, sustained them in combat, and compelled many to return to combat assignments. Piloting military aircraft gave them access to the power of the most technologically advanced aircraft in the world. In flight training, pilots learned to control these high-performance machines, and in the process of doing so, learned to control their own apprehensions as they built confidence in their own abilities. Fledgling aviators also learned to enjoy surmounting the risks inherent to flying powerful aircraft through their growing expertise. They came to believe that their comrades who "washed out" of flight school or crashed and died did so because they had "screwed up," and their skills were not up to the task. For those who successfully completed flight school, their newly asserted control over powerful aircraft gave them an addictive sense of freedom in the sky, where they could fly in ways they had only imagined before. A nineteen year old American Spitfire pilot captured some of this joy in his famous sonnet "High Flight," penned weeks before his death in December 1941:

> *Oh! I have slipped the surly bonds of earth*
> *And danced the skies on laughter-silvered wings*
> *Sunward I've climbed, and joined the tumbling mirth*
> *Of sun-split clouds – and done a hundred things*
> *You have not dreamed of…*[17]

---

[17] John Gillespie Magee Jr. was American but joined the Royal Canadian Air Force in violation of American neutrality. He completed "High Flight" during Spitfire training in Britain, and died in a midair collision three months later. His poem is very widely known in military aviation circles. Hermann

Air Force navigators and enlisted flight crew members experienced a more limited sense of power and freedom, which crews of multi-place aircraft shared collectively. Most significantly, they exercised little control in flight because the aircraft commander—a pilot—had control and authority for the aircraft. Non-pilot aircrew members found a way to exercise a degree of control by proving themselves capable of providing unique and valuable aviation expertise to their pilots. Their most powerful motivation was founded in a desire to contribute their essential and unique technical expertise to the accomplishment of a challenging and important mission.

Flight school and subsequent acculturation into the Air Force's flying communities instilled other motivational factors, which were derived from the power, control, and freedom of flight. From a military aircraft's power sprang an obligation: airmen felt duty-bound to use the immense power under their control to help fellow combatants, especially American soldiers, whose lives often depended on overwhelming and accurate firepower from above. Second, the degree of control needed to operate a military aircraft spawned a competitive drive for perfection and a desire to demonstrate that excellence to one's fellow fliers. Because flying was (and still is) inherently risky, excellent flying ability helped to keep an aviator alive, underscoring an inherent self-preservation interest, but being seen as a "good stick" was also the main avenue to secure status, respect, and honor among an elite but meritocratic community of aviators. Third, the freedom of flight engendered a desire to exercise that freedom and make the decisions on how to best accomplish the mission, solve inflight problems, and minimize risks. After basic flight training, aviators wanted to apply their cumulative skills, expertise, and judgement to overcome

---

Hagedorn, *Sunward I've Climbed: The Story of John Magee, Poet and Soldier, 1922-1941* (The Macmillan Company, 1942).

challenges posed by flight hazards or enemy action. This interest in exercising the full freedom of flight and a flier's autonomous judgement led to inevitable frictions, if not clashes, with higher authority.

The analysis that follows applies two frameworks to assess how Air Force airmen experienced combat in Southeast Asia, and what motivated them to fly and fight there. The interplay between mission, risk, and authority provides a common framework to compare the varying experiences of battle across the three case studies that follow. From case study to case study, the missions flown, the risks encountered, and the autonomy granted to Air Force aviators varied substantially. Missions perceived to be important by the crews, with limited risks, and high autonomy posed few motivational challenges, while dangerous missions that seemed to be irrelevant, flown under close supervision from higher headquarters posed the greatest challenges. These three elements changed over time, and were strongly impacted by American strategy and technology. The three elements were also closely interconnected; fighter pilots assigned to bomb targets around Hanoi faced far greater risks than bomber crews assigned to hit guerilla base camps west of Saigon. Some crews enjoyed immense latitude in how they carried out their missions, while others were so regulated (especially those around Hanoi) that President Johnson reportedly boasted "they can't even bomb an outhouse without my approval."[18]

An assessment of the varying missions in Southeast Asia will consider what airmen were ordered to achieve, how they understood their assigned tasks, how they carried them out, and how they believed those tasks contributed (or did not contribute) to the overall American strategy. An airman's perception of the relevance of his mission, how it helped or hindered the overall

---

[18] William C Westmoreland, *A Soldier Reports* (Garden City, NY: Doubleday, 1976), 119.

American effort, and how it helped his fellow combatants affected his commitment and enthusiasm, or generated doubts over the course of the war. Pilots who believed their missions against downtown Hanoi were pushing the North Vietnamese towards defeat saw their missions differently from bomber crews who believed their attacks on jungle bases were accomplishing little more than making trees into matchsticks. Although many bombing missions were directed against enemy infrastructure and war materials, countless missions required airmen to direct massive firepower against people, be they regular soldiers, guerillas, their supporters, or hapless Vietnamese, Laotian, or Cambodia civilians trapped between the warring parties. How airmen accomplished, and then rationalized, killing from the air comprises a significant element of an assessment of their mission.

The risks of flying in combat constitute the second element of the framework for analysis. Aviation entails an inherent degree of risk, and Southeast Asia's primitive infrastructure increased the hazards with its limited air traffic, weather reporting, navigational beacons, and short jungle airstrips. The constant interplay of competing offensive and defensive technologies determined an even greater element of risk for many American fliers. The dangers posed by North Vietnam's antiaircraft guns, surface-to-air missiles, and MiG fighter capabilities waxed and waned across the course of the war, as American fighter, bomber, and electronic warfare systems improved and interacted with the adversary's systems. When the North Vietnamese introduced surface-to-air missiles in 1965, they were ascendant for a year and a half until American engineers found the right combination of mitigating warning devices, radar jamming, and homing missiles to permit routine operations in airspace defended by missiles. There was often an inherent tension between accomplishing a mission and exposure to risk. With unguided bombs, the closer a pilot got to his target, the more accurate his attack would be, but he would also be

closer to more antiaircraft guns, increasing the risks. No mission could be accomplished without risk, and all airmen sought the ability to determine how to best balance the competing elements on a mission-by-mission basis by applying their flying skills, devising imaginative tactics, and employing the best and latest technology to influence the odds in their favor.

Authority is the third element of the framework and was a perpetual point of contention between crews and headquarters. Pilots were trained to assert their control over their aircraft from their first flights in pilot training. As they gained skills and confidence in their abilities, they believed that they should exert control over their fate as they led formations against the enemy. But no airman experienced completely unfettered latitude in deciding how to best accomplish his assigned missions or how to mitigate the risks. The guidelines imposed by higher headquarters most visibly embodied in a controversial set of "rules of engagement" limited aircrew autonomy by placing airspace and targets off limits. A thirty-mile buffer zone along the Chinese border, for example, channeled American fighter formations into heavily defended corridors through North Vietnam. The level of control granted and exercised impacted both sides of the mission and risk balance and pilots attitudes and provides the third element of the framework.

A second framework supplies a means to consider differing motivational challenges and responses by the men who flew over Vietnam. How crews surmounted the challenges and the competing demands of mission, risk, and subordination provides an indicator of their motivation. An aviator's willingness to fly in combat and the degree of risk he was willing to accept indicated his combat motivation. The range of potential responses to the stresses of battle varied from a few rare refusals to fly, to cautious risk-avoidance, to high risk, low altitude tactics that exposed crews to the heaviest antiaircraft defenses. In his history of the late Eighteenth Century French Revolutionary Army, *The Bayonets of the Republic*, historian John Lynn divides motivation into

three phases: initial motivation, sustaining motivation, and combat motivation. Lynn defines initial motivation as the concerns surrounding "the decision to become a soldier, to enlist or at least to comply with conscription." Sustaining motivation describes a soldier's reaction and willingness to conform "to military life, but not to combat," while combat motivation describes motivation in actual battle, which Lynn believes "stands out as unique because of the overwhelming presence of fear. Death is near; decision and action must come fast, if they come at all." Lynn's distinctions, with some modification, are helpful to this dissertation because different motivational factors affected military fliers before their initial exposure to combat, their motivation in battle, and then their willingness to return to battle once they had experienced it. Initial motivation, within the context of this dissertation describes a young aviator's early attitudes towards military flying, where danger is distant and abstract. Combat motivation, as in Lynn's definition, describes an airman's reactions to actual combat flying, where danger becomes real and personal. Sustaining motivation, within this dissertation, describes an airman's motivation when away from combat (at one's base, for example), but slightly diverging from Lynn's usage, applies only after one's exposure to battle.[19] An airman with sufficient sustaining motivation was willing to return to battle having known great danger. This act of will, to return to danger once knowing it, was for many, the most difficult quality of motivation to muster.

---

[19] Lynn uses sustaining motivation as a means to evaluate how well recruits accepted military life outside combat. "There may be danger, but even close to the front the greatest enemies may be discomfort and boredom." Although the circumstances in Southeast Asia were far different, his intent still has consonance with the experience of Vietnam-era aviators, who were bored and grumbled when they were not flying—despite the dangers. The only key qualifier in this use of the term "sustaining motivation" is the previous exposure to combat. Before a flier's initial exposure to battle, his motivations are best understood through the concepts surrounding initial motivation because he still has largely idealistic notions of battle. While in combat, Lynn's definition fits well "as is." John A. Lynn, *The Bayonets of the Republic: Motivation and Tactics in the Army of Revolutionary France, 1791-94* (Urbana: University of Illinois Press, 1984), 35-36.

Although it can be challenging to distinguish from memoirs or oral histories what form of motivation acted on an aviator and when, these three elements of a framework help to disaggregate motivation that varied by situation and exposure to danger in the air.

Mirroring Mark Wells' analysis of World War II flyers, there were undoubtedly "scores" of "interrelated factors which kept men motivated" to fly in Southeast Asia. Those most prominent probably changed from day to day for each aviator, and many motivating factors are likely unknown to even the combatants themselves. This dissertation attempts to identify those most prominent among airmen assigned similar missions and aircraft. There are certain to be exceptions to the most prominent motivators, and there is no guarantee that some evidence cited is not exceptional, although I have attempted to select anecdotes and quotations that are representative of multiple participants from the oral histories, end of tour reports, and memoirs that comprised the bulk of the research for this dissertation.

There are limitations to the records available because some populations of Air Force aviators left far fewer records than others. My imperfect searching, for example, has located only one memoir by an Air Force rescue helicopter pilot, while there are scores produced by Vietnam-era fighter pilots. Some communities, like rescue helicopters and gunships were very small compared to the large numbers of men who flew forward air control aircraft or fighters. There are very few accounts by enlisted aircrew members. Although they make up a small population compared to pilots, few left oral histories and none penned memoirs. The evidentiary base for this population is relatively narrow. How airmen experienced combat over Southeast Asia and what motivated them comes primarily from the words of the combatants. Oral histories from the Air Force's Historical Research Agency, Texas Tech's Vietnam Center and the Library of Congress figure most prominently in this dissertation. Many of the Air Force Historical Research Agency's

oral histories were collected shortly after the completion of combat tours and have a sense of immediacy. Although some may have restrained their comments because they were still serving on active duty, most are very frank and contain sharp criticisms on the conduct of the war. Another group of oral histories came from the 1980s and 1990s when a cohort of general officers who had flown as mid-grade officers in Vietnam retired. These individuals did not have further promotions on the line, but accounts given ten to twenty years after the fact are subject to the faults of memory. The oral histories from the Vietnam Center and Library of Congress are even more recent, and warranted close scrutiny and cross-checking due to the passage of time from the original events. Contemporary print media, unit publications, official histories, and non-print media including songs, photographs, and documentaries provided alternative sources.

In the sections that follow, an introductory chapter is followed by three case studies chosen to describe the war in the air across three different periods and geographic areas. Chapter Two, which immediately follows, describes the common roots of the generation of Air Force aviators who flew in Southeast Asia and the initial motivations that drew them to become Air Force aviators. Three major influences powerfully affected this generation of airmen. World War II, initial flight training, and acculturation into one of the Air Force's flying subcultures shaped the attitudes and behavior of these men towards flying and combat.

The subsequent chapters present case studies that provide three different Southeast Asian contexts for examining a variety of Air Force aviator's experiences and motivations. Operation Rolling Thunder (1965-1968), the "in country" air war over South Vietnam (in 1968), and Operation Commando Hunt (1968-1972) organize the analysis to cover the spectrum of Air Force aircrews, technologies, missions, risks, and authority. The general pattern of each chapter describes what combat flying was like in each campaign by aircraft type with a strong emphasis

on how men interacted with the technology of their combat aircraft and how it shaped their perceptions of battle. Not all aircraft types are represented; this study focuses on several of the most predominant types in each operation.[20] The air war over South Vietnam, for example, was dominated by tactical fighter operations, but a sufficient range of fighter operations are considered in the other two case studies, and the in country air war provides a unique opportunity to examine the experiences of other important sub-communities of Air Force airman (forward air controllers, tactical airlift, and bomber crews). Subsections on the competing demands of missions, risks, and authority will follow (although not always in the same order) before concluding each section with an assessment of aircrew motivation.

There were many controversial aspects of the air war over Southeast Asia, and those aspects are addressed only as they affected the crews who flew there and how (or even whether) they perceived and talked about those controversies. Much ink has been spilled over the efficacy and morality of strategic bombing; this dissertation does not evaluate the relative merits of the debate, but limits itself to how airmen tried to carry out the bombing of the North, and the doubts they may have harbored—mostly over the will of their own leaders. Likewise, this dissertation does not evaluate the merits of the controversial rules of engagement (which were designed to contain and restrict the violence of aerial bombing), but presents how the men fighting the war perceived the rules and how they dealt with them. During Rolling Thunder, airmen dropped three and a half times the tonnage of bombs on South Vietnam than they dropped on North Vietnam,

---

[20] Because there are so many dimensions of an eight-year air war, this dissertation cannot be a comprehensive account of Air Force experiences there. There are many fascinating stories to be told about smaller communities of dedicated airmen who flew tactical reconnaissance, electronic warfare, air refueling, and command and control missions not described here. The final campaigns: Linebacker I and II are also not analyzed here, although many dynamics present in Linebacker were present in the earlier campaigns covered by the existing case studies in this dissertation.

but most airman deferred to the authority of others on the ground or circling overhead as forward air controllers to determine the validity of a target, which allowed them to focus on the technical aspects of hitting their target and put any introspection off until long after the mission debriefing.[21] This dissertation does not weigh the validity or utility of such policies, but instead illuminates the difficulties encountered at the bottom of the chain of command in understanding and implementing those policies.

Across the war and across the Air Force's flying communities, aviator's intrinsic motivations to fly, to excel, to win, and to be in control motivated them to fight in Southeast Asia. A strong sense of duty and obligation to use the unique power of their aircraft and their expert flying skills to aid fellow combatants—sometimes a close comrade, but very often not—drove these men to risk their own lives to support others. Encouraged to be the best aviators, and taught to assert control over their machines and themselves, aviators sought the greatest possible degree of autonomy and control over their missions. When their superiors in Washington, Saigon, or in their own wing command post did not appear to be as committed to winning the war or supporting fellow combatants as the flyers on the line, many quietly broke the rules and fought the war on their own terms. Others dutifully complied with directives. Bomber commanders demanded flawless compliance and established intrusive oversight and centralized control to ensure bomber crews adhered to the letter of the law. Fighter commanders had less intrusive oversight, but compliance often hinged on their personal leadership in the air. Those leaders who led from their desks were less likely to successfully reign in the behavior of their highly motivated subordinates, while those who led by example, shared the dangers of the toughest

---

[21] Mark Clodfelter, *The Limits of Air Power: The American Bombing of North Vietnam* (New York: Free Press, 1989), 129.

missions, and flew well earned the respect and loyalty of their subordinates. But regardless of their leader's style, the American men who flew over Southeast Asia flew to satisfy their internal desires to control powerful military aircraft and enjoy the freedom of flight they had long sought.

Chapter 2: Forging a Generation of Airmen

In spring 1967, Lt Clyde Edgerton stepped onto the flight line at Laredo Air Force Base with his instructor pilot, Lt Jackson. The two men strode excitedly towards a T-38 Talon trainer for Edgerton's introduction to the final and most advanced phase of pilot training which put student pilots at the controls of the T-38 for 120 flight hours. For Edgerton and his peers, the T-38 was a dramatic step up in speed and performance from the docile, blunt-nosed straight-winged T-37 primary jet trainer (unofficially nicknamed the "Tweety Bird") they had spent the previous five months training in. The sleek and gleaming white Talon featured tiny swept-back wings, a trim coke-bottle waist, and a pair of turbine engines that promised speed and performance. Within a few minutes, they rolled from the parking ramp, a moment Edgerton had long anticipated: "as we taxied out, I thought about how I'd watched pilot after pilot taxi out in the T-38, dreaming of my chance." As his instructor demonstrated a takeoff, Edgerton tried to keep up with the new speeds and sensations, beginning an acclimatization process common to Air Force flying training that featured graduated exposure to increasingly challenging flying tasks. "We began to pick up speed. I felt pressed back in my seat....Almost before I could think about what was happening, we were airborne, gear up, flaps up." With full afterburner power, "the aircraft climb[ed] almost like a rocket. I looked outside, down at the earth, which seemed to be shrinking, and then I looked at the altimeter...and the minute hand was making one revolution [per thousand feet] every two seconds!" They zoomed to the aircraft's maximum ceiling to demonstrate high and fast flight. "Lieutenant Jackson raised the nose of the aircraft and entered a rapid climb, still in afterburner. The altimeter showed 20,000, 30,000, 40,000 feet. The sky turned a darker and darker blue. At

52,000 feet the sky was a very deep blue, unlike any I'd ever seen. The airframe began to buffet a bit," clawing for lift from the thin air. "We were as high as we could go and as high as I'd ever again be from Earth." Then, at the aircraft's ultimate ceiling, ten miles above the ground, an engine flamed out. Lt Jackson noted somewhat matter-of-factly, "Oh I forgot to tell you this might happen. Lack of oxygen. Engine failure. No problem." They re-started the engine within a few minutes at a lower altitude and completed Edgerton's initiation into the ranks of supersonic jet pilots. Edgerton found the mission so thrilling that all of his previous memorable experiences in the air "were fading into the second row of all-time exciting flying events" compared to this introduction to the T-38.[1]

Edgerton was one of 2,768 student pilots to successfully master the Talon and earn Air Force pilot wings in 1967, and several aspects of his experience typify those of his generation of airmen. The process that would ultimately lead them to strap themselves into an Air Force cockpit and hurtle through sophisticated enemy defenses over Southeast Asia began long before they joined the military. An early desire to fly, successful competition through an unsparing accessions process, graduated exposure to high performance aircraft, and acclimatization to danger embedded a habitual drive for perfection in flying, relentless competition, and a taste for risk-taking. Risk came hand in hand with high performance. The T-38 was high-strung for a trainer, and was particularly unforgiving to pilots who got slow too near the ground. In 1967, pilots crashed thirteen Talons, triple the annual losses of its partner, the T-37 Tweety Bird.[2] But pilots

---

[1] Clyde Edgerton, *Solo: My Adventures in the Air* (Chapel Hill, NC: Algonquin Books of Chapel Hill, 2005), 76-80.

[2] The Air Force lost four T-37s in 1967. Across the entire Vietnam War years 1965-1973, the Air Force lost two T-41 propeller-driven primary trainers, forty-four T-37 basic jet trainers, and eighty-six T-38 advanced trainers in inflight mishaps. Of those mishaps, forty-eight (or 36 percent) involved one or more pilot fatalities. Air Force Safety Center, "Aircraft Statistics," http://www.afsc.af.mil/organizations/aviation/aircraftstatistics/index.asp.

came to believe in themselves and their abilities to overcome risks by seeking perfection in their flying skills. Edgerton recalled "danger was always out there, just out of reach—you hoped. And for me and my buddies, that risk, plus our firm belief that we couldn't die before old age made our flying lives an adventure."[3] Buoyed by an abundance of self-confidence, Air Force aviators enjoyed a high degree of self-actualization gained from controlling powerful military aircraft, and enjoyed a profound sense of freedom and excitement in flight training, and often in battle.

Flight training was one of three major influences that shaped the generation of men who flew in combat over Southeast Asia. This chapter describes how American aviation culture and World War II provided an initial motivation for a cohort of young men to seek opportunities to fly in the U.S. military, how flight training imprinted a common set of their attitudes and behaviors, which were then further shaped by the Air Force's distinctive fighter, bomber, and transport subcultures. World War II was a major catalyst for the men who flew over Southeast Asia; it provided the motivation and the opportunity for those old enough, to fly against Germany and Japan. The war's aviation imagery inspired those too young for fighting to dream about flying when they were old enough. The power and attractive lines of modern combat aircraft added to the allure of military aviation. Upon entry to the military, basic pilot and navigator training imprinted a common culture founded on the power, control, and freedom of military flight. Flight instructors taught their young trainees to harness the power of high performance military aircraft by flying at high speeds, high altitudes, and expertly operating cutting edge technology. By learning to master their aircraft, fledgling aviators also mastered their own apprehensions which instilled a sense of tremendous self-confidence and control. Excellence in the air earned a young aviator the grudging respect of demanding flight instructors and status among one's peers. Flight school's training regime and environment generated considerable

---

[3] Edgerton, *Solo*, 91.

socialization between young trainees, but also created an environment of relentless competition because class standing determined follow-on aircraft assignments. Competition and unsparing evaluations by flight instructor cadres sparked a lifelong drive for learning, self-improvement, and excellence as an aviator that was continuously revalidated to oneself and one's fellow aviators. After flight training, young pilots and navigators earned their wings and reported to different major commands for advanced training in their assigned aircraft type. The Air Force's major commands, especially Strategic Air Command and Tactical Air Command, imprinted strong sub-cultural values on their newly-minted pilots and navigators. These sub-cultures, which differentiated between bomber, fighter, cargo, and interceptor crews, diverged due to the unique missions and aircraft types operated by each command. These three powerful influences, World War II, undergraduate flight training, and the Air Force major command subcultures combined to shape the generation of Air Force airmen who fought the war in Southeast Asia.

Initial Motivation: "I Couldn't Wait to Get There"

Air Force pilots and navigators who flew in Vietnam were officers born between the 1920s and 1940s. They came from a range of economic backgrounds, but were predominantly white and all male. Aviation was available to graduates of normal commissioning programs such as West Point, the Reserve Officer Training Corps, and after 1959 the Air Force Academy, although the bulk of Air Force aviators came from the aviation cadet program through the 1950s. World War II created a tremendous demand for military aviators, which vastly expanded the small existing aviation cadet program to approximately two hundred and fifty thousand young men who graduated from pilot, navigator and other specialized aviation training programs during the war. The aviation cadet program quickly filled wartime cockpits, and provided a path for aspiring civilians without a college education to earn a commission and wings. The attraction to

flight knew no class boundaries, as the aviation cadet program opened flying to young Americans from working class backgrounds. Numerous memoirs from the older Vietnam cohorts stress humble beginnings and working-class family backgrounds. The aviation cadet program drew down in the 1950s, closing to pilots in 1961 and navigators in 1965, as the Air Force Academy and other commissioning sources met flying training demands.[4] This led to an increasing percentage of flyers from privileged backgrounds because commissioning mandated a college degree after the aviation cadet program ended. Air Force flyers were all male because women were barred from combat flying, and were overwhelmingly white.

Despite the notoriety earned by the Second World War's Tuskegee Airmen, at the end of World War II there only were 1,533 African-American officers, or 0.4 percent of the Air Force's total officer population.[5] The Air Force integrated in 1947, and by 1951 the last segregated unit disbanded. Prominent African-American flying units like the Tuskegee Airmen disbanded and the small numbers of black flyers integrated into existing flying units, which complicates contemporary visibility into the racial demographics of the Air Force aviation community. Anecdotally the population of flyers appears to mirror the very small percentages of officers.[6]

---

[4] Dr. Bruce Ashcroft, "We Wanted Wings: A History of the Aviation Cadet Program" (Randolph AFB, TX, 2005), 1, Headquarters Air Education and Training Command, Office of History and Research.

[5] Although African-American officer percentages climbed somewhat in the 1950s, it was not until 1963 that their numbers topped 2,000 within a population of roughly 130,000 officers. During the Vietnam War only forty-seven African-Americans graduated from the Air Force Academy, and African-American officers never exceeded 1.8 percent of the Air Force's officer population. Alan L. Gropman, *The Air Force Integrates, 1945-1964* (Washington, DC: Office of Air Force History, United States Air Force, 1985), 166-7 and xvii..

[6] Japanese-American fighter pilot Bob Kan, for example, described himself as "the only non-Caucasian among 250 pilot-trainees" in 1955. Kan's research identified only four Hawaiian USAF fighter pilots and one prominent Japanese-American USAF POW during Vietnam. Bob Kan, *(I Am) A Real American: Memoirs of a 3rd Generation Japanese-American USAF Fighter Pilot* (Bloomington, IN: AuthorHouse, 2008), 3, 46, 65.

American aviation culture and World War II provided powerful attractions towards military aviation for the generation of men who would fly in Southeast Asia. In the 1920s and 1930s, aviation culture promised progress, streamlined, clean, and functional design, and provided heroic role models like pioneer Charles Lindberg. Cultural historian Robert Wohl argues that flight was a "spectacle" in the 1920s, 30s, and 40s, and that the airplane was an "exemplar of the modernist aesthetic."[7] American aviation culture provided a strong inspiration and initial motivation for many young men to fly. William Creech, an F-100 squadron commander in Vietnam, was inspired from age five by a model of the Spirit of St Louis he received a year after Lindberg's famous Atlantic crossing. He read about flying throughout his childhood until flying—his "new mistress imbedded her claws into my entire being." When World War II broke out, it spurred many young men with an interest in flying to act on immensely expanded wartime opportunities to apply for flight training. Creech wanted to get into uniform and into a cockpit as quickly as possible and "wax the hell out of those damned Japs." He entered flight training and eventually made his way into P-51 fighters over Burma against the Japanese.[8]

For the generation raised in the 1930s and 1940s, World War II elevated military aviation in print and material culture. Balsa wood airplane models and war news coverage strongly affected young George Thatcher (a future B-52 pilot). "I would sit there carving P-51s and P-40s and Messerschmitts and Focke-Wulfs and do mock dog fights in my room." Closely following the newsreels "from the Battle of Britain to the bombing raids over Tokyo and then Hiroshima

---

[7] Robert Wohl, *A Passion for Wings: Aviation and the Western Imagination, 1908-1918* (New Haven: Yale University Press, 1996), 1-6.

[8] William T. Creech, *The 3rd Greatest Fighter Pilot* (Bloomington, IN: AuthorHouse, 2005), 16.

and Nagasaki," Thatcher projected himself "right up there in the cockpit with them. So, it seemed to me like I always wanted to fly. Never got it out of my system, [and I] probably never will."[9]

The American imagination elevated pilots as invincible heroes. Comics strips, pulp novels and movies idealized flyers and influenced a generation. Pulp magazines like *G-8 and his Battle Aces* and *Blackhawk,* and comic strips like "Terry and the Pirates," and "Tailspin Tommy" portrayed a vivid and exciting vision of combat flying. Korean ace and Vietnam F-4 pilot, F.C. "Boots" Blesse recalled, "I read *G-8 and his Battle Aces*, 'Tailspin Tommy,' and 'Captain Eddie' [Rickenbacker] was my hero…The picture was always in the back of my mind—fighter pilots diving, climbing, turning, finally destroying the enemy aircraft; bringing honor and glory to themselves and their country."[10] Many memoirs and oral histories reflect the idea of a "picture" stuck in the minds of aspiring flyers; many who became pilots recalled a personal image that inspired them. An early 1940s picture of a Navy dive-bomber pilot inspired Col Jacksel "Jack" Broughton, an F-105 pilot. "That was the hottest picture I had ever seen. I could easily visualize myself in that front cockpit, and every detail of that picture is crystal clear to me [in 2008]. I knew I wanted to be a military pilot."[11] Twenty five years after the World War, Robert Mize recalled an equally memorable and inspirational wartime poster. "It was on all the billboards and it showed a young kid with a leather helmet on and goggles and a P-38 or 51, or something flying up through the air." Mize was excited that "the text of the whole thing was that he enlisted… and at age seventeen learned to fly." Like Broughton, Thatcher and many others of their generation,

---

[9] George Thatcher, interview by Jonathan Bernstein, November 15, 2001, 10, The Vietnam Archive, Texas Tech University.

[10] F. C. Blesse, *Check Six: A Fighter Pilot Looks Back* (Mesa, AZ: Champlin Fighter Museum Press, 1987), 56.

[11] Jack Broughton, *Rupert Red Two: A Fighter Pilot's Life from Thunderbolts to Thunderchiefs* (St. Paul, MN: Zenith, 2007), 23.

Mize was inspired to fly by wartime flying imagery. "Well, I was approaching that age and man, I couldn't wait to get there."[12]

The movies played a major part in painting glamorous and exciting visions of pilots, generating enthusiasm for pilot training over all other aviation specialties. Many of the most prominent and masculine movie stars portrayed pilots as manly heroes. Douglas Fairbanks, Humphrey Bogart, Spencer Tracy, Ralph Bellemy, Cary Grant, James Cagney, and David Niven played the role of daring World War I fighter pilots in early flying movies such as *Wings*, *Dawn Patrol*, and *Hells Angels*. John Wayne played the first of six movie roles as a pilot in *Flying Tigers* which was released in 1942.[13] John Wayne was the iconic American war hero and role model to the generation that fought in Vietnam. One pilot born in 1931 assigned to the F-105 wing at Kadena Air Base recalled: "I spent my early years as a WWII wannabe." Reflecting on others from his generation he recalled, "back then all us kids played war games and pretended we were warriors….My idol was John Wayne and I must have seen *Sands of Iwo Jima* a dozen times."[14]

Bomber pilots shared equal billing during the war and were portrayed by Errol Flynn, Ronald Regan, Dana Andrews, and most famously by Spencer Tracy in *30 Seconds over Tokyo.* In the decade after the war, Clark Gable and Gregory Peck were depicted as tough bomber commanders memorializing the Eighth Air Force's bomber offensive against Germany in

---

[12] Lt Col Robert L. Mize, interview by Hugh N. Ahmann, September 21, 1971, 27, Air Force Historical Research Agency, Maxwell AFB, AL.

[13] John Wayne also played a fighter pilot in "Flying Leathernecks" (1951), and "Jet Pilot" (1957). He portrayed a transport pilot in "Island in the Sky" (1953), a commercial airline pilot in "The High and the Mighty" (1954) and an adventurous scout pilot in "Wings of the Eagle" (1957). "John Wayne," *The Internet Movie Database*, accessed February 6, 2010, http://www.imdb.com/name/nm0000078/; "Military Aviation Movie List," accessed February 6, 2010, http://www.coastcomp.com/av/fltline2/avmovie.htm.

[14] Dean Hunter, *For Love of Life and Country* (New York: Vantage Press, 2003), 8.

Command Decision and *12 O'Clock High.* The post-war Air Force made it onto on the big screen with Jimmy Stewart as a Strategic Air Command (SAC) bomber pilot, and Rock Hudson as a SAC bomber wing commander. This dramatic imagery drew a generation of boy's interest to flying and to the pilot role especially. Although bomber crews combined the collective skills of navigators, bombardiers, gunners and radio operators, mass media most prominently featured pilots as the leader and central character. The Vietnam generation sought pilot slots first, and accepted navigation training as a distant second choice as an alternative but less attractive path to an Air Force cockpit. Spencer Tracy, Clark Gable, Rock Hudson, Steve McQueen, and Jimmy Stewart all depicted bomber pilots. The iconic bomber movie, *12 O'Clock High* depicts the human costs of the air war over Europe as borne by the pilot group commanders. In *12 O'Clock High*, pilots make the decisions, drive the mission, and look after the troops. Crews are referred to by their pilot's last name (i.e. "Bishop's Crew"), and when the group commander is unwilling to sanction a navigator for a costly error, he is reminded that "good navigators are the one thing we're not short of."[15] A near universal comment on initial motivation to fly among Air Force aviators was the desire to fulfill a dream based on many of these idealized pilot images.

Power, Control, and Freedom: Undergraduate Flight Training

The route from youthful aspirations to aviation wings passed through either basic pilot or navigator training. Aspirants applied for flight screening as part of the aviation cadet program, or they applied for flight training following an officer accession program, often part of a college commissioning program already described. Service needs, medical screening, aptitude testing, and individual preferences determined whether aviation hopefuls entered pilot or navigator

[15] Henry King, *Twelve O'Clock High*, DVD, 1949.

training. Those qualified for pilot training attended a year-long undergraduate pilot training (UPT) course. Ninety-seven percent of aviation cadets requested pilot training during World War II, but those who screened well for potential navigation skills (which required higher aptitude scores) attended navigator training. Pilot training required stricter medical requirements, and 20/20 eyesight was often the fork in the road between pilot and navigator training. The undergraduate navigator training (UNT) ranks also included some candidates who had washed out of pilot training, or were qualified for pilot training but did not want to wait for a delayed training slot. The Air Force's history of the Aviation Cadets notes that due to the "publicity and glamour given to pilots" there was a morale problem among those selected for navigator and bombardier training and that Training Command officials recommended to the Air Force chief that "an attempt should be made to publicize and glamorize bombardiers, navigators and gunners."[16] Marion Marshall entered the Air Force Academy in 1964 and "wanted to fly from the day I got there," and planned to go to pilot training. "Then my eyes started going bad." Marshall still wanted to fly, "so I went to nav school" as an alternative.[17] Stephen Katz went to pilot training in 1961 but "was not successful" because "I was letting the airplane fly me. I was just kind of sitting there watching what was happening instead of taking command of the aircraft, which, at some point in time will kill you." Control would prove to be the key to success during UPT and throughout a pilot's flying career. Katz proved better suited for UNT and excelled as a navigator in C-130s. "I studied accounting, and it's kind of the same thing. You just kind of have to keep track of numbers and

---

[16] Ashcroft, "We Wanted Wings: A History of the Aviation Cadet Program," 45.

[17] Lt Col Marion A. Marshall, interview by Dr. James C. Hasdorff, August 13, 1991, 10, Air Force Historical Research Agency, Maxwell AFB, AL.

keep track of what you were doing. It was fun and it was interesting and it did come rather easy to me."[18]

Air Force undergraduate pilot training was a challenging year-long course that tested the mettle of pilot candidates, initiated them in a unique pilot culture, and ingrained a love of flying founded on flight's intrinsic qualities of power, control, and freedom. This demanding course took classes of fledgling aviators through successive levels of increasing complexity. Students progressed through training blocks of basic flying, aerobatics, instrument flying, navigation and then formation flying. Each represented a new layer of complex skills that built upon the fresh foundations of skills learned in earlier training phases. Pilot training gave young trainees access to powerful machines, well beyond those of their previous experiences. During the year, pilots moved up through a succession of two, three, or more aircraft of increasing power, performance and complexity.[19] Each aircraft had more powerful engines and could fly higher and faster than the previous trainer. John Nelson described the progression most pilots encountered during the 1960s. "We started in a little Cessna type airplane that the Air Force called the T-41. That was really a washout kind of a program. In other words, if people couldn't get through that the government wanted to wash you out of the program early rather than spend a lot of money on you to go through training." The small and inexpensive T-41 was a modified civilian aircraft and served as a docile trainer. After proving himself in the T-41, Nelson and his fellow trainees

---

[18] Stephen Katz, interview by Dr. Richard Burks Verrone, January 21, 2003, 15, 17, The Vietnam Archive, Texas Tech University.

[19] The number and type of different aircraft used in pilot training depended on the year of the course because the technology and training flow evolved for the Vietnam generation of pilots. Between 1939 and 1973, the Air Force modified its pilot training syllabus forty-seven times. A trainee in 1944 might fly as many as nine different aircraft during pilot training, while pilot trainees between 1961 and 1965 only piloted two aircraft, after which the T-41 propeller-driven light aircraft was introduced as a third trainer. Office of History and Research, "Major Changes in Undergraduate Pilot Training 1939-2002" (Headquarters Air Education and Training Command Randolph AFB, TX), accessed September 4, 2010, http://www.aetc.af.mil/shared/media/document/AFD-070130-081.pdf.

moved up to fly higher performance jets. "Later, then we went to the jets, which were the T-37 aircraft." The T-37 was a military trainer with performance roughly comparable to a World War II fighter. "That's where we first soloed in the jet aircraft. I was in that program about five or six months and then we graduated and moved up to the T-38, which is a supersonic fighter."[20] This graduated exposure to more powerful aircraft was intimidating at the beginning of each new step up in performance, but it was also thrilling as each step brought the ability to fly higher and faster. With a takeoff speed of 160 knots, the T-38 could not even get airborne as it accelerated through the little T-41's maximum speed of 145.[21] Ed Cobleigh found that as he "became comfortable with jet speeds and used to high performance flight" at UPT, "I found myself blithely doing aerial maneuvers that only a few months ago would have scared me shitless."[22]

Flying was inherently risky, and young aviators became used to sensing and dealing with risk. Instructors drilled trainees relentlessly on how to deal with mechanical failures, bad weather, and created habit patterns to minimize human errors. Despite their best efforts to minimize the risks, Air Force pilots crashed 132 trainers during the war, averaging one crash every twenty-two days over the eight years of the war.[23] Although some men crashed and died, those who mastered the complexities and risks of jet flight derived tremendous satisfaction and excitement from the experience. High performance flight conveyed a sense of power and of freedom from the ground; it was also intensely satisfying as student pilots gained confidence in their ability to control

---

[20] The T-38 was designed as a high-performance trainer, although a variant of the T-38, the F-5 Tiger II is a fighter. John Nelson, interview by Kim Sawyer, December 13, 2000, 3, The Vietnam Archive, Texas Tech University.

[21] USAF, "T-41 Checklist T.O. 1T-41C-1CL"; Maj Buck Wyndham, "Warbird Alley: Northrop T-38 Talon Pilot Report," accessed February 6, 2010, http://www.warbirdalley.com/articles/t38pr.htm.

[22] Ed Cobleigh, *War For the Hell of It: A Fighter Pilot's View of Vietnam* (New York: Berkley Caliber, 2005), 48.

[23] Air Force Safety Center, "Aircraft Statistics."

increasingly capable and increasingly dangerous machines. That self-confidence became a key to controlling fear.

Through gradual acclimatization to successive layers of power and complexity, student pilots learned to control high performance aircraft as they also learned to control their own fears. Early flights introduced basic aircraft control including recovery from unusual conditions like aircraft stalls or spins and progressed to aerobatics and formation flying. At first, many of these maneuvers seemed frightening and the aircraft might be briefly out of control in a stall or spin. Trainees learned to keep their heads and senses despite radically nose-high and low aircraft attitudes and wild gyrations, and put the aircraft back into control. Training syllabi reintroduced this sequence of maneuvers in successively more advanced aircraft as pilots learned to control increasingly powerful and dangerous machines. By introducing flight maneuvers and aircraft in a building-block approach, students felt apprehension but learned to how to control themselves, their machines, and became inoculated to fear. Ed Cobleigh believed that through "constant sampling" of fear in UPT, he "learned to fend off certain varieties of fear….The first day a junior officer in the USAF straps on an airplane, the desensitizing process begins and it continues without respite as long as landing gear continue to retract and jets become airborne."[24]

Gaining control of a high-performance machine was exhilarating and generated a euphoric sense of freedom that for most, would inevitably conflict with authority and limitations. A student pilot's first solo flight in a new aircraft was a memorable mixture of apprehension and joy. By applying the procedures learned under the close supervision of their instructors, student pilots found that they could control an airplane by themselves, building self-confidence. Alan Trott recalled the thrill of his first solo flight "I remember just shouting at the top of my voice as

---

[24] Cobleigh, *War For the Hell of It*, 48.

soon as I got off the ground. It was great success."[25] Initial solo flights were thrilling, but limited to flight in the traffic pattern under an instructor's watchful eye. Subsequent solo flights featured flights to nearby training areas for practice maneuvering. These solos away from the traffic pattern provided an opportunity to practice controlling a powerful aircraft and to exercise the freedom of flight without nearby supervision or oversight.

Solo flights gave young pilots the opportunity to revel in the freedom of flight, which was experienced at multiple levels. The initial freedom was a physical escape from the ground. The ability to leave the surface of the Earth and wheel and soar like a bird could be exhilarating, as described in the poem "High Flight." A deeper sense of freedom also accompanied flight, which liberated aviators from life's ground-borne concerns. Because flight is a complex activity that requires concentration and focus, aviators were trained to "compartmentalize" their thinking and focus on flying, at the exclusion of other non-flying concerns.[26] Successful compartmentalization allowed flyers to shed many of their worries once strapping into their aircraft, and to focus solely on their flying responsibilities. Those flight trainees who were unable to compartmentalize were less likely to successfully complete flight training, or to be successful aviators if they made it through their training. In peacetime, this mental freedom provided a pleasant escape from day-to-day worries, while in combat, it helped aviators shut out fears and concentrate on the job of flying and accomplishing the mission. These freedoms led to a third aspect of freedom that derived from the environment of the sky. Once airborne, aviators gained a perspective of the ground that was

---

[25] Trott went on to pilot C-123 aircraft in Vietnam. Allen Trott, interview by Dr. Richard Burks Verrone, March 4, 2003, 12, The Vietnam Archive, Texas Tech University.

[26] The term "compartmentalization" was made familiar to military aviators by a famous naval flight surgeon Capt Frank Dully in the late 1970s. Dully argued that "compartmentalization offers a system to exclude distractions" so that "those things that do not contribute to the mission of flying…are excluded from his conscious." Frank E. Dully, "The Life Style Keys to Flight Deck Performance of the Naval Aviator — Another Window" (Naval Air Station Pensacola, FL, est 1985), 4, Naval Aerospace Medical Institute.

without borders and physical boundaries. The flight paths of their aircraft were restricted by aerodynamics, that limited one's maximum height and speed, but all other limitations were man-made and invisible. Procedural mandates, training airspace boundaries, restricted areas, and political borders were imposed on aviators in the interest of safety and regulation, and the temptation was always there to exceed artificial boundaries that seemed inconvenient or troublesome. In this sense, freedom also meant freedom from external controls. Pilot training made young pilots very rule-conscious, and most pilots were very rule abiding, but when taken to an extreme, expectations of freedom could conjure up a dark side of some aviator's psyches when their appetite for freedom routinely overwhelmed flying guidelines in the air and led to buzzing, low level aerobatics, and other rule violations. Taking such risks could lead to greater thrills and adrenaline levels. In some, ever-wider excursions from the norm were accompanied by excesses on the ground like excessive drinking, destruction of property, springing pranks on non-flyers, and disrespect of authority.

Student solo training missions flown outside the airfield traffic pattern gave young pilots the opportunity to test the boundaries imposed by higher authorities and claim as much freedom as they dared. Free from their instructor's scrutiny, young pilots often "pressed to test" the safety boundaries established by the authorities.[27] When his class moved up to the advanced jet phase in pilot training, Dean Hunter recalled his classmates flew through the Grand Canyon and buzzed fire trail roads below the height of the crops.[28] Many other pilot accounts recall flying too low, too high, or engaging in some unofficial and unsanctioned mock dog-fighting. On his first

---

[27] "Press to Test" described a cockpit task, where pilots pushed in a test button to check the operation and accuracy of a gauge, or press a questionable light-bulb to light it and verify its operational condition. But "press to test" in a general sense meant press the boundaries to test what one could get away with.

[28] Hunter, *For Love of Life and Country*, 90-97.

unsupervised solo, Richard Hamilton attempted some new aerobatic maneuvers he had read about. "I thought, well I'll get ahead of the game, I'll do some acrobatics because I read the book. I thought I was going to kill myself, I ended up straight down, going too fast, scared and got out of it and of course I got back and my instructor looked at me and he said, 'You didn't do something dumb did you?'" Although he denied any wrongdoing, Hamilton recounted "I was probably redder than a beet and he knew I was lying, but I think most everybody did that, you just didn't want to admit it."[29] Recalling pilot training F-105 pilot Ron Bliss confessed, "in pilot training I broke a lot of rules," but he also saw his instructor pilot break several rules as well.[30] The freedoms of flight—speed, height, and lack of physical boundaries in the sky—meant pilots bumped up against artificial rules and limits imposed by their superiors and flight regulations every flight. Small excursions were commonplace, but could not be encouraged or officially acknowledged by superiors.

Air Force pilot training instilled a closely-related set of motivation founded on the power, control, and freedom of flight. Most prominently, effective and exact aircraft control provided individual satisfaction, helped mitigate risks, and earned a pilot the respect of his peers. Richard Hamilton recalled the words of his UPT instructor, encouraging him to be the best pilot. He "told me 'to imagine that someone was watching me' when I flew. He said that I should always strive to make the perfect takeoff, hold the perfect position in formation, fly the perfect approach, and make the perfect landing. 'You must always strive for perfection…That's the way you stay

---

[29] Richard Hamilton, interview by Dr. Richard Burks Verrone, April 10, 2003, 9, The Vietnam Archive, Texas Tech University.

[30] Bliss recalled his instructor exceeding the prescribed limits as well. A fighter pilot assigned to teach at pilot training, he far exceeded their trainer's redline speed when arriving at a fighter base claiming "I'm not coming in like a chickenshit tweety-bird pilot" in front of his former fighter pilot peers. Ronald G. Bliss, interview by Dr. James C. Hasdorff, October 17, 1991, 23, Air Force Historical Research Agency, Maxwell AFB, AL.

alive."[31] Trainees were judged continuously by those around them on their ability to control their aircraft, and pilots yearned to earn a reputation as a "good stick." The training environment reinforced a fledgling aviator's drive for perfection, through constant competition within a tight social group and the need to prove oneself as a competent aviator to self, peers, and instructors. Demanding instructor pilots examined and graded every flight with unsparing criticism for how the flight could have gone better. Pilots who flew well derived a high degree of fulfillment from performing a difficult and exciting task well. They also gained status among their peers and earned the ability to fly higher performance aircraft since assignments were merit-based. A student pilot who failed to perform well in pilot training was in danger of washing out of pilot training, which provided a powerful negative incentive. Of the 3,758 men to enter pilot training with Edgerton in 1966-67, 1,056 were eliminated from the program. Over the course of the Vietnam War, 9,403 men "washed out" and failed to earn pilot wings, 26.2 percent of those to enter training.[32] Flight training embedded patterns of behavior on those who could perform up to the high standards and removed those unable. The constant critique of pilot performance stirred in most pilots a search for perfection—since flying was (and is) a highly complex activity, it was seldom possible to perform every task perfectly and there was always the opportunity to improve. The joy of flight and the demands of flying well developed in most a lifelong passion for learning and improvement that pilots carried into combat in Southeast Asia. [33]

---

[31] Dick Hamilton, "Memoirs of Thailand - A Fighter Pilot's Journal," in *Red River Valley Fighter Pilots* (Paducah, KY: Turner Publishing Company, 2000), 41.

[32] Ann Krueger Hussey, "Air Force Flight Screening: Evolutionary Changes 1917-2003" (Office of History and Research Headquarters Air Education and Training Command Randolph AFB, TX, December 2004), 41.

[33] For a glowing journalistic look at USAF pilot training in the height of the Vietnam War, see Herbert Molloy Mason, *The New Tigers* (New York: D. McKay Co, 1967). 22-169.

Young pilots acculturated into a meritocratic group culture centered on pilot socialization and intense competition. Flying expertise was the primary means to secure one's place in an elite group of high-performing and like-minded individuals. Young flyers sought the acceptance of their fellow aviators, and believed that their opinions mattered because they were fellow flyers. Flight instructors held the power over a fledgling's future, and classmates provided an indispensible social support during a very demanding year. Each class of student pilots progressed through the different phases and aircraft, staying together for the year of flight training. Within these classes, students formed strong social bonds due to the intensity of the common challenges faced throughout the year. Anthony Borra recalled the confidence he gained from his solo flight and the social side of pilot training as the two most memorable aspects of UPT. "You have all the camaraderie, a lot, a lot of camaraderie. A lot of social activity and a lot of hanging out."[34] Although all student pilots strove to perform at high levels of competency to perfect their flying skills and gain acceptance, there was also an atmosphere of intense competition among the flyers because class ranking determined assignments after pilot training.

Each pilot training class received a mixture of fighter, bomber, and cargo assignments. Trainees looked forward with excitement and nervous anticipation to their assignment to an operational aircraft. Fighter assignments were in high demand, and fighter pilots invariably pointed out their high class standing. Throughout the early to mid-1960s, the top pilots generally chose assignments in single-seat F-105 and F-100 fighters, followed by F-101, F-102, and F-106 interceptors.[35] Even as F-105 losses mounted in the first years of Rolling Thunder, F-105s

---

[34] Anthony Borra, interview by Dr. Richard Burks Verrone, March 25, 2003, 26-27, The Vietnam Archive, Texas Tech University.

[35] After the mid-1960s a new generation of aircraft began to replace the "century series" fighters (F-100 through F-106), and after 1969, young fighter pilots could be assigned directly to the front seat of the F-4 Phantom.

continued to go to the top graduates. Young pilots regularly opted for powerful, fast, and exciting aircraft with little mind towards potential dangers. The next stratum of pilots often opted for F-4 backseat assignments (with the expectation to upgrade later to the front seat). The next went to C-130 transports and other large aircraft. Some high performing students who might have qualified for fighters opted for cargo for a variety of reasons. Some became very attracted to the precise aircraft control needed to fly instruments and volunteered for cargo aircraft, more interested in a meticulous form of control than the potential freedom offered by a fighter. Others volunteered for transports with the intention to transition to the airlines after serving a five-year service obligation. The lowest tier was often sent to bombers and air refueling tankers in the Strategic Air Command. Clyde Edgerton recalled "practically everybody wanted a fighter and nobody wanted bomber, especially the B-52. Flying the B-52, we were told was boring—hours of doing nothing at a very high altitude out of range of surface-to-air missiles (SAMs) and then a few seconds of pressing a button to release bombs, then more hours of nothing."[36] Performance determined choices; either to gain the most attractive assignments or to avoid the worst ones, and spurred competition and high performance throughout flying training and set a pattern for subsequent years as an aviator.

Young officers and aviation cadets destined for undergraduate navigator training (UNT) learned a highly-technical skill to precisely determine the position of an aircraft anywhere in the world using a variety of sensors and then predict and guide its course to arrive at the desired destination on time. Under the exacting scrutiny of instructor navigators, aspirants for navigator wings learned to keep an accurate navigation log that dutifully recorded aircraft altitudes,

---

[36] Edgerton, *Solo*, 101; Col William R. Ricks, interview by Anthony T. Bradley, November 11, 2005, 9, Adams Center, Virginia Military Institute; Brig Gen Ralph T. Browning, interview by Dr. James C. Hasdorff, September 25, 1991, 7-8, Air Force Historical Research Agency, Maxwell AFB, AL; Timothy R. Ayres, interview by Dr. James C. Hasdorff, October 17, 1991, 8, Air Force Historical Research Agency, Maxwell AFB, AL.

airspeeds, drift, and headings and then apply principles of dead reckoning to estimate the aircraft position. Compared to pilot training, navigation was less about control than it was about precision. Stephen Katz, who let the airplane "fly him," failed as a student pilot because he did not exert control over the aircraft, but excelled as a navigator due to his intelligence and skill with numbers.

Student navigators flew in the back of a twin-propeller T-29 "Flying Classroom" throughout the 1950s and 1960s.[37] Arranged in two rows, six to twelve student navigators sat at navigation tables equipped with a few basic instruments, a radio compass, and a radar scope, where they kept their meticulous navigation logs and peered into radar scopes, radio navigation sets, or sextants to calculate a position over the ground. Just like their peers at pilot training, student navigators learned to master increasingly complex tasks, which built on previously learned skills. At each level, aspiring navigators mastered the techniques and technologies of navigation and gained self-confidence in their abilities. Stephen Katz recalled that "you went through various phases of training, for example, celestial navigation, you would get some practice missions, day and night, celestial and then you'd get a check ride" and then progress to a new block of instruction.[38] During the radar phase of UNT, students peered into radar scopes at their training stations on the T-29 that provided a presentation of the ground below. After hours of instruction and practice, students were able to interpret the blotches on their scopes into towns, roads, rivers, lakes, and mountains and accurately determine their position. To Robert Harder (who would rely on his radar as a B-52 navigator) "this radar scope interpretation turned out to be much more difficult than any of the men had anticipated; being able to properly compare/contrast the 'snowstorm' of indistinct, white-on-black radar screen returns with the cultural and

---

[37] Ashcroft, "We Wanted Wings: A History of the Aviation Cadet Program," 65.

[38] Katz, interview, 11-12.

topographical features depicted on the aeronautical chart took a great deal of practice." Under the watchful eyes of his instructors, "there was more than a little getting lost on these radar missions in particular, something that was allowed to happen by the instructors and pilots to drive various lessons home."[39]

On celestial missions, student navigators used portable sextants to "shoot" (measure) the height of the sun, moon, and/or stars. Then, by interpolating between tabular data in thick air almanacs, the trainees could calculate and plot a "line of position" on their charts, and then with several other lines of position from other stars or atmospheric pressure, determine their position.[40] Harder felt that "becoming proficient in day and night cel[estial] was at the heart of navigator school; once successfully accomplished, the student was on the home stretch. For most men the celestial phases were the most satisfying part of their entire training—deliciously elemental disciplines that relied almost solely on an individual's wits for success." Although Harder noted that ground radio beacons were easier to use, when systems failed "the well-trained celestial navigator would come to view the sun, moon, planets, and stars as his most loyal and trustworthy friends."[41]

Student navigators experienced the joys of flight differently than their pilot partners did. There was a limited sense of freedom in the back of the T-29. The aircraft was high above the ground and able to fly in any direction, but the aircraft was slow and lumbering. Fighter pilot Ed Rasimus checked out in the T-29 during a staff tour at Air Training Command headquarters and

---

[39] Robert O. Harder, *Flying from the Black Hole: The B-52 Bombardiers of Vietnam* (Annapolis, MD: Naval Institute Press, 2009), 65.

[40] John A. Parker, interview by Stephen Maxner, July 20, 2000, 9, The Vietnam Archive, Texas Tech University; Richard Marks, interview by Stephen Maxner, August 27, 2002, 14-15, The Vietnam Archive, Texas Tech University.

[41] Harder, *Flying from the Black Hole*, 70.

"thoroughly detested" the aircraft, preferring his desk job "to driving the unmaneuverable air-thrashing, slow-moving fifties-era people-mover."[42] Young navigation students gained power through the use of electronic sensors (radar and other navigational beacons) to see the ground through darkness and poor weather. Most different from their pilot peers, however, was the question of control. The student navigators exercised little control because the aircraft commander—a pilot—had access to the aircraft controls and authority over the aircraft. The students took turns directing the pilots in the front of the T-29, providing speed, altitude, and heading corrections over the intercom to keep the trainer on track. The navigator's agency was limited and advisory in nature as part of a collective effort. Navigators exercised their agency through their pilots and sought to contribute their unique technical expertise to the accomplishment of a common mission.

Undergraduate navigators experienced the same level of scrutiny and constant evaluation as their pilot-trainee peers, which instilled a similar drive for individual excellence and the need to prove oneself. This drive for perfection led to considerable self-confidence in the skills learned at UNT. Richard Marks, for example, became very confident in his abilities with celestial navigation, and when conditions were right, he was able to determine his position within a mile using the stars. "You could be very good. The more you shot, the better you got."[43] Graded evaluations and check rides fed into class standings, which like the pilots, determined assignments. Those at the top of the class chose their aircraft before those ranked lower. William Beekman wanted to get into the back seat of a fighter which spurred him to perform well at UNT. "I graduated in the top 10 percent. There were varied choices of assignments between follow-on

---

[42] Ed Rasimus, *Palace Cobra: A Fighter Pilot in the Vietnam Air War* (New York: St. Martin's Press, 2006), 12.

[43] Marks, interview, 16.

schools, which would be either navigator/bombardier school or electronic warfare school and then specialize in those areas, or a varied number of aircraft, and the top one, of course, especially that the Academy grads jumped at, were F-4s. So I picked an F-4."[44]

"Bomber Pilots and Fighter Pilots Think Differently": Air Force Subcultures

Graduation from flight training represented a significant transition; at UPT and UNT, trainees flew for the sake of flying. Upon graduation and transition to an operational aircraft, they flew to accomplish a mission. The power, control and freedom of flight took on a new dimension as young airmen learned to control the unique powers of their operational aircraft to accomplish an assigned mission. Bomber crews learned to precisely control their powerful aircraft to lift heavy bomb loads and put them on target; fighter pilots learned to maneuver freely through the air in twisting dogfights to gain a position of advantage over an enemy plane; cargo crews learned to accurately guide their big planes around the world to deliver heavy cargo loads; and rescue helicopter crews learned how to hover motionless to lower a rescue hoist to an airman in distress a hundred feet below. The distinct capabilities of each aircraft type led to different degrees of control and freedom afforded by each community that operated these aircraft. Air Force bomber generals believed the bomber's heavy payload mandated tight centralized control and minimal freedom, fighter generals sought to maximize the fighter's autonomy and freedom due to the fluid and rapidly changing nature of an air-to-air dogfight, while transport generals believed precise instrument procedures would allow their crews to deliver their cargo in poor weather and night, but local innovations would be necessary to solve problems while out of touch from headquarters at far-flung and primitive airfields.

---

[44] William D. Beekman, interview by Dr. James C. Hasdorff, June 19, 1991, 9, Air Force Historical Research Agency, Maxwell AFB, AL.

Aircraft choices made at UPT and UNT had a tremendous impact on the trainee's future development as an Air Force aviator. Trainees thought they were picking an airplane after graduation, but more importantly, they were picking a culture. The Air Force's major commands divided the Air Force's different aircraft types, operated their aircraft very differently, and constructed divergent cultures around those unique practices. Each command had different approaches and attitudes towards flexibility, autonomy, conformity, aggressiveness, and competition. Differing approaches towards flying became important over Southeast Asia as cultures mixed and clashed in the crucible of combat. Fighter pilot Richard Bach commented on the differences he observed between pilots from differing commands in 1963: "One fighter squadron motto sums up the attitude of fighter pilots everywhere: *We can beat any man in any land in any game he can name for any amount he can count*. In contrast, I read on the wall of Base Operations at a multiengine base: *The difficult we approach with caution. The impossible we do not attempt*. I could not believe it. I thought it must have been someone's idea of a joke for the day."[45]

Major commands—of one hundred thousand or more people, run by four-star generals, operated the service's diverse aircraft types, and shaped aircrew acculturation. The four major commands that absorbed the bulk of each year's new pilots were Strategic Air Command (SAC) which operated America's nuclear bombers and tankers, Air Defense Command (ADC) which operated fighter interceptors to defend North American skies from a Soviet nuclear attack; Tactical Air Command (TAC) which operated fighters, light bombers, and tactical transports to

[45] Richard Bach, *Stranger to the Ground* (New York: Harper & Row, 1963), 126.

win air superiority and to support the army; and Military Airlift Command (MAC) which operated the Air Force's cargo fleet.[46]

Each of these major commands developed a distinct flying culture due to the unique characteristics of their aircraft and mission. SAC was responsible for America's nuclear-armed long range bombers and intercontinental ballistic missiles. Since the Cold War required these nuclear forces to be on constant alert, a by-the-book checklist mentality dominated SAC. Nuclear weapons allowed little margin for error and were centrally controlled; SAC bomber crews adopted a similar attitude towards flying, emphasizing standardization and control. Compared to the crews from other commands, they enjoyed relatively few of the freedoms of flight because they flew large un-maneuverable aircraft under intense scrutiny from SAC commanders and evaluators. SAC crews then took great pride in the size and power of their aircraft and the precision with which they operated, but because SAC assignments featured little autonomy and few opportunities to experience substantial freedom inflight, SAC assignments were often the least desired in flight school. Exacting checklist execution and precise navigation and timing—all desirable attributes when dealing with nuclear weapons—were tied to institutional rewards and recognition.

The Military Airlift Command operated a global chain of large transport planes and placed a premium on precise flying (often on instruments in bad weather) and flexibility. The Air Force's cargo fleet operated routinely far from home and in many undeveloped parts of the world. As a result, MAC crews experienced a rewarding form of inflight freedom by accomplishing their far-flung missions without much support or oversight. Unlike SAC's "by the book" ethos, MAC crews needed to apply innovation and improvisation to solve unanticipated problems at remote

---

[46] Military Airlift Command (MAC) replaced its predecessor, Military Air Transportation Service (MATS) in 1965. This narrative will use Military Airlift Command to generalize about both backgrounds because MAC operated throughout the Vietnam War.

sites with primitive infrastructure. Because large aircraft required a crew to operate, similar to SAC bombers, good crew coordination—working together precisely—was a valued attribute to MAC crews.[47]

The Air Defense Command (ADC) was responsible for the defense of America's skies. ADC's modern missile-equipped interceptor force had the high-stakes mission of stopping Soviet bombers and relied on precise control from ground radars and radar controllers to intercept high and fast flying Soviet bombers in the case of war.[48] High-speed interceptions were difficult to accomplish, and only a few seconds of poor timing could result in a missed interception. Accurate control, then, was important to ADC senior commanders, and its pinnacle was a massive computerized system called the semi-automatic ground environment (SAGE) capable of automatically flying interceptors to a missile launch point against aerial targets. ADC pilots flew fighter-type aircraft and routinely enjoyed all the freedoms of operating high-performance jets, but conflicted with their commanders over individual agency as ADC's command and control systems sought to exercise greater control over the pilots and planes. Encouraging pilots to surrender their control to the automated system was a common leadership challenge for ADC commanders. Before he was assigned to fly F-105s in Southeast Asia, Jack Broughton commanded an F-106 interceptor squadron and observed the conflict that affected core pilot values of freedom and control: "not all pilots completely accepted the system's automatic

---

[47] Military Airlift Command played a minimal role inside the theater in Southeast Asia; it handled long-haul airlift responsibilities into the theater. MAC's culture, however, was important as MAC-trained crews were cross trained into fighters, forward air controllers, and other aircraft types.

[48] Air Defense Command operated a few F-102 interceptors to provide air defense for South Vietnam and a contingent of EC-121 radar planes (predecessors to the more modern and well-known E-3A AWACS), but the greater significance of Air Defense Command (like Military Airlift Command and other Air Force sub-cultures) came into play as crews from different communities cross-trained into TAC-type aircraft and tried to integrate into new communities. As later chapters describe, interceptor pilots had some difficulties integrating into tactical fighters, but their transition was much easier than those pilots who transitioned from large multi-engine cargo aircraft into fighters.

capability, since pilots had been making manual intercepts forever. It was more fun to try to do it manually, and that was the macho thing to do."[49]

Tactical Air Command owned the fighter force, light bombers, and troop carriers, but its ethos was dominated by single-seat, single-engine fighter planes. Operating agile, fast, and maneuverable planes, TAC pilots operated powerful modern aircraft, exercised local control, and used this flexibility and individual agency to enjoy many freedoms of flight, underscoring Robert Rilling's assessment that flying fighters was more "fun" than flying the B-52 bomber.[50] Because TAC was responsible for the air superiority mission, TAC pilots practiced dog-fighting at every opportunity. Practice air-to-air encounters provided an exhilarating and competitive man-to-man test of flying skills, during which success hinged on sharp eyesight, quick thinking, and quick reactions. Success in air-to-air engagements was a creative and intuitive process—every situation was different—and unsuited for a SAC-like checklist approach, or centralized control. Richard Baughn flew as a fighter pilot in World War II and then went on to command a SAC bomber unit as a brigadier general, and recalled feeling out of place in SAC due to the mindsets driven by different cultures. "You just feel like a third shoe, a third foot" and he believed that "if a SAC guy came to a TAC base, he would probably feel the same way." From a common base in pilot and navigator training, the major commands imprinted different approaches to their unique missions and aircraft. In the words of Baughn, "Bomber pilots and fighter pilots are two different types. Always have been. They think differently and act differently."[51]

---

[49] Broughton, *Rupert Red Two*, 271; Jud McLester, *Thru a Pilot's Eye: Cold War Through Vietnam Era* (Bloomington, IN: 1st Books, 2004), 50-59.

[50] Rilling, interview, 15.

[51] Brig Gen Richard M. Baughn, interview by Hugh N. Ahmann, March 20, 1979, 59, Air Force Historical Research Agency, Maxwell AFB, AL.

The Air Force's biggest divide—that between SAC and TAC—had the most significant effect on the Air Force in Vietnam. Due to the Cold War's nuclear standoff, SAC dominated the Air Force's vision, mission, promotions, and equipment for two decades after World War II. But Vietnam was a war dominated by TAC aircraft and missions. SAC's culture of compliance, standardization and checklist approach contrasted sharply with TAC's flexibility, aggressiveness, and independence. These contrary approaches to flying and control will be sharply contrasted between Chapter Eight, which examines SAC's role in Arc Light, and the other case studies which highlight TAC-dominated missions. The context of the SAC-TAC divide is important background for the Vietnam War because it left TAC unprepared for a war it would play the predominant role in. The Strategic Air Command's nuclear mission dominated the Air Force's aircraft development throughout the 1950s and early 1960s, impacting the Air Force's readiness to fight conventional wars. World War II bomber pilots gained the mantle of post-war Air Force leadership and elevated the nuclear bombing mission above all others. The rapid growth of American nuclear armament led to a widening array of aircraft expected to deliver nuclear weapons, and that limited the money and attention available for non-nuclear airplanes.[52]

The Tactical Air Command organized, trained and equipped the Air Force's fighter force after World War II and was responsible for acquiring the majority of the planes and training the crews who flew in Vietnam. By 1968, TAC and its affiliated commands in the Pacific and Europe were responsible for roughly seventy-nine of the eighty-five flying squadrons in Southeast Asia

---

[52] Marcelle Knack's cataloguing of Air Force Cold War bombers describes eight new bombers fielded after World War II and a dozen experimental types, illuminating the Air Force's interest in bomber development. Col Mike Worden's landmark *Rise of the Fighter Generals* details the human and cultural side of SAC's impact on USAF leadership (and the eventual change to a fighter-led Air Force). Marcelle Size Knaack, *Post-World War II Bombers*, vol. 2, Encyclopedia of US Air Force Aircraft and Missile Systems (Washington DC: Office of Air Force History, United States Air Force, 1978); R. Michael Worden, *Rise of the Fighter Generals: The Problem of Air Force Leadership, 1945-1982* (Maxwell Air Force Base, AL: Air University Press, 1998).

and 1,641 of the 1,768 aircraft deployed to Vietnam and Thailand.[53] SAC's dominance of the Air Force in the 1950s and 60s strongly affected the planes that TAC fielded from the late 1950s to Vietnam. SAC's dominance pushed TAC into a subsidiary nuclear role in order to compete for funds. Air Force fighters, once renowned for excellent dog-fighting capabilities, necessary to counter enemy fighters, shifted towards less maneuverable strike aircraft optimized for low altitude and high-speed nuclear attack in the late 1950s.[54] Due to TAC's dominant role in Southeast Asia, the design of its aircraft and the interplay between fighter technology and TAC culture is addressed in the first case study and provides a basis for comparison in subsequent cases. SAC culture and its interaction with bomber technology are explored in depth in Chapter Eight.

TAC's top fighter, the F-105 Thunderchief, seemed hardly a fighter at all. It entered service in 1958 and epitomized the nuclear strike role; it was big, heavy, complex, fast, and un-maneuverable. The F-105's weight and small wings allowed it fly low and fast in a straight line—the type of flying envisioned for the delivery of a nuclear weapon. Those same small wings, however made the F-105 a poor dogfighter, unable to turn tightly. The F-105's complex navigation systems and nuclear-delivery techniques heavily taxed the skills of TAC's single-seat

---

[53] TAC was responsible for the fighter, attack, tactical airlift, reconnaissance and special operations squadrons. The Air Rescue and Recovery Service was responsible for the rescue assets, and SAC was responsible for the bomber and tanker squadrons (numbers do not include SAC squadrons in Japan and Guam). John T. Correll, *The Air Force in the Vietnam War* (Arlington, VA: The Air Force Association, December 2004), 9.

[54] For an assessment of the aerodynamics of different TAC fighters of the era, Craig Hannah's *Striving For Air Superiority* takes the reader from the physics equations to an assessment of the aircraft. For an excellent account of TAC's existential fight for autonomy within the Air Force, and the impact of that fight on aircraft development, see Paul Gelpi's 2002 dissertation: Paul Dunbar Gelpi, "Forging the Sword: Tactical Air Power and the United States Military Experience, 1950--1961" (Ph.D. dissertation, The University of Alabama, 2002), 100-140, 184-222; Craig C Hannah, *Striving for Air Superiority: The Tactical Air Command in Vietnam*, Texas A & M University Military History Series 76 (College Station: Texas A&M University Press, 2002), 31-65.

fighter pilots. Nuclear delivery practice crowded out the training available for dog-fighting and dive-bombing, skills most needed in Rolling Thunder. Gen Wilbur Creech, a Vietnam wing commander and later commander of TAC summed up the impact of the Air Force's nuclear focus on TAC's training and equipment. From 1960 to 1962 he ran TAC's premier training program, the USAF Fighter Weapons School, a six-month expert program for the command's top instructor pilots: "[a] big part of our course was teaching nuclear weapons and nuclear employment. We were a baby SAC," whose sole focus was nuclear weapons. "Those running the Air Force simply had not developed a new fighter. We had nothing on the drawing board."[55]

In 1962, the Air Force turned to the US Navy for an additional fighter more suited to the air-to-air role. The Navy's F-4 Phantom II featured a large radar to detect enemy aircraft and the latest air-to-air missiles to shoot them down. Anticipating a future dominated by long-range missile engagements, the F-4 lacked an internal gun like its partner, the F-105. It was also a large aircraft but it had two engines and a bigger wing than the F-105 giving it greater power and maneuverability. The Phantom's powerful engines allowed it to carry a significant bomb load, giving it a multi-role capability to attack targets in the air or on the ground.

"A Temperament That is Born of Competition": Air Force Fighter Culture

Fighter replacement training units (RTU), where pilots learned to fly the F-105 and F-4, further reinforced the social and competitive dimensions of the Air Force's fighter culture. Challenging training stressed excellence in flying, self-reliance, innovation, and independence, but it also demanded loyalty between the members of a flight of aircraft. Formation flying

---

[55] Gen Wilbur L. Creech, interview by Hugh N. Ahmann, June 1992, 42, Air Force Historical Research Agency, Maxwell AFB, AL.

reinforced teamwork and trust between a flight leader and his wingman.[56] The competitive atmosphere inherent to fighter squadrons reinforced individual bombing skills and dog-fighting. F-105 pilot G.I. Basel recounted "fighter piloting is an endless competition. Scores are posted for all to see by your name; strafe, skip-bomb, dive bomb….you could look around the room and say he's #1, he's #2, and so on. The ratings changed daily."[57] Although class standing was based largely on weapons scores, competition to beat each other on the bombing range was further underscored and personalized by betting drinks or small change between pilots over bombing and strafing scores.[58] Career fighter pilot F.C. Blesse believed he was driven by competition all his life: "In the fighter pilot, it is something different. He has a temperament that is born of competition; every step that he takes all of his life, he feels and senses the competition of people around him."[59] Mock dog-fighting was a welcome activity and seen as the true test of a pilot's skill, yet there was seldom enough training due to the many missions competing for limited training time. Nuclear attack practice, conventional dive-bombing, and practice air-to-air combat all came from the same limited pool of available training missions.[60]

---

[56] Ronald Bliss recalled that his F-105 instructors pushed the trainees to dangerous levels to see if they would flinch from their formation responsibilities "he wanted to know…who was going to…back out? Who was going to fade? You're better off with four black holes in the mountainside [then backing away from a dangerous maneuver]. At least you died with your dignity." Bliss, interview, 29.

[57] G. I. Basel, *Pak Six: A True Story* (Kearney, NE: Morris Publishing, 1982), 6. Major Ken Bell's standing in Fighter Weapons School hinged on an intense competition for the most accurate weapons drops. An inadvertent release of a single training bomb set him back irreconcilably: "I was disgusted" with the unfortunate miss, "and terribly disappointed." Ken Bell, *100 Missions North: A Fighter Pilot's Story of the Vietnam War* (Washington, DC: Brassey's, 1993), 10-15.

[58] Brig Gen Robinson Risner, interview by Capt Mark C. Cleary, March 1, 1983, 145, Air Force Historical Research Agency, Maxwell AFB, AL.

[59] Maj Gen F.C. "Boots" Blesse, interview by Lt Col Gordon F. Nelson, February 14, 1977, 18, Air Force Historical Research Agency, Maxwell AFB, AL.

[60] Craig Hannah's research indicates a third of training sorties within fighter training units were dedicated to air-to-air. Oral histories indicate far fewer air-to-air sorties were available once crews reached their operational fighter units. Hannah, *Striving for Air Superiority*, 93.

The F-105 could have been labeled a light bomber, and the F-4 a fighter-bomber, but the men who flew them considered themselves fighter pilots. The maneuverability of their aircraft, and the autonomy and freedom they enjoyed, gave legitimacy to their claim. Fighter pilots saw their independence, self-confidence, and hyper-competitiveness as qualities that set them apart from other flyers, perhaps best illuminated by the fighter squadron motto "I can beat any man in any land…" recalled by Richard Bach. Air Force pilots flew several varieties of lower-performance attack aircraft over Southeast Asia, most notably the aged propeller-driven A-1 Skyraider. Even though the Skyraider lacked the performance of contemporary jets, the men who flew it considered themselves fighter pilots, and informally nicknamed their craft the "Spad," to establish a romantic connection to fighter planes of a half-century earlier. Although fighter pilots yearned to fly the hottest aircraft, their identity began with their attitudes, which they then tied to their aircraft.

During initial training, all aircrews developed a special bond with their assigned aircraft type, and this bond was especially passionate between fighter crews and their machines. Ernest Hemingway noted the phenomenon as a war correspondent in 1944: "a man has only one virginity to lose in fighters, and if it is a lovely plane he loses it to, there his heart will ever be."[61] Initially intimidated by a new and powerful machine, once mastered, fighter pilots tied their identities strongly to the airplane they flew. Fighter navigators, first brought into TAC in 1965, developed a similar affinity.[62] F-105F back-seater Jay Jensen expressed pride in his aircraft. "I

---

[61] This Hemingway quotation is commonly cited by fighter pilots, but amusingly labeled as "his nadir as a correspondent" by Stanley Kauffmann, "New Republic," in *Ernest Hemingway: The Critical Heritage*, ed. Jeffrey Meyers (Routledge, 1997), 522.

[62] Navigators trained in electronic warfare began to man SAM-hunting versions of the F-100F and F-105F in 1965 and 1966. Navigators entered the mainstream fighter force in 1969 when they replaced pilots in the back seat of Air Force F-4s.

took a long loving look at our bird….It's no wonder everyone who flies the Thud falls in love with her….I was really thrilled and proud to be flying that aircraft."[63] Jensen's confidence in himself extended to confidence in his aircraft. Familiarity with an aircraft bred confidence, and aircrews sought to exploit their aircraft's unique attributes. The F-105's size, speed, and rugged construction, for example, were reassuring to the men who flew it. G.I. Basel remarked that "the plane was incredibly tough. We grew to expect five to seven minutes of high-speed escape from that magnificent old bird." In spite of frequent battle damage, "it just kept going." Basel, like most of his peers believed the aircraft "had heart, and we loved it." Once the cockpit became a familiar environment, it could be a reassuring haven from the chaos of battle outside the aircraft. "It seemed impossible that any bullet could ever penetrate all that iron around me. I felt snug and safe, securely strapped into this cocoon of steel."[64] Fighter pilot and author Richard Bach described an intimate man-machine reciprocal relationship: "we have gotten to know each other. My airplane comes alive under my gloved touch and she gives me the response and performance that is her love." As partners, "we enjoy our life together."[65] Growing confidence in one's ability and one's aircraft, combined with the aviator's competitive spirit, resulted in intense partisanship.

Competition extended from individuals to an intense rivalry between communities associated with different aircraft types. Maj Ken Bell observed this competition closely at the Fighter Weapons School, where courses with all the major USAF fighter types ran concurrently. "The individual competition between pilots was keen, but it was secondary to the tribal rivalry that stemmed from our unflinching loyalty to the airplanes we flew: the F-100, F-4, or F-105.

---

[63] Jay R. Jensen, *Six Years in Hell: A Returned POW Views Captivity, Country, and the Nation's Future* (Bountiful, UT: Horizon Publishers, 1974), 30-33.

[64] Basel, *Pak Six*, 70, 74-75.

[65] Bach, *Stranger to the Ground*, 23.

Each tribe of pilots was certain that their airplane was best and was willing to do anything to prove it."[66] Each aircraft picked up unofficial nicknames, the F-105 nickname morphed from Thunderchief to Thunderthud (for a bumbling character on *The Howdy Doody Show*) to simply Thud, which was derisively designed to simulate "the noise made by a large heavy object hitting the ground."[67] The F-105 pilots liked the nickname and it became initially, to insiders, a term of affection, and during the war, one of respect. Ken Bell recalled a time when an F-4 pilot at the Fighter Weapons School used "Thud" irreverently and the situation came to blows between pilots.[68]

Although relations between the different fighter communities were normally more physically constrained, the rivalry between F-105 and F-4 crews was perhaps the most significant because these two aircraft types became the workhorses of the Rolling Thunder air campaign and represented two philosophies—the Thud's self-reliant single-seat, single-engine ethos contrasted with the Phantom's emerging two-seat, two-engine ethos that featured a cooperative system of shared control and power between the front and back-seaters. As the war progressed, the older single-seat F-100 and F-105s were gradually replaced by more capable two-seat F-4s, and by Commando Hunt, aspects of the Air Force's traditional single-seat fighter culture shifted to a shared form of control between pilots and fighter navigators (called weapons systems officers) based on co-dependent niches of technical expertise.

From the F-4's introduction to the Air Force, TAC's single-seat fighter partisans rejected the F-4 for its naval origins and two-seat configuration. Although the F-4 offered substantial

---

[66] Bell, *100 Missions North*, 11.

[67] Mike (pseud) Laurence to Lydia Fish, "The Thud," January 7, 1994, accessed January 4, 2009, http://faculty.buffalostate.edu/fishlm/folksongs/thud.htm.

[68] Bell, *100 Missions North*, 12.

advances in maneuverability, power and technology, single-seat F-100 and F-105 shunned it because it was a Navy-designed airplane and ran counter to a traditional USAF preference for single-seat, single-engine fighters.[69] The F-4 had a second seat for a crewmember to operate the radar and an inertial navigation system. The Navy filled the rear cockpit with Naval Flight Officers instead of pilots, but the Air Force elected to man their F-4s with a second pilot. Pilots assigned to the backseat were dissatisfied because fate denied them the opportunity to control the aircraft, a job they had trained for and long aspired to. Phantom back-seater, Howard Hill believed that an assignment to the backseat was an affront to his pilot skills. "A lot of us were thinking we would be single-engine jocks.…we had soloed…we had flown formation; we had done all sorts of things. We felt like young tigers and now we were going to be put in the back seat with another guy."[70] Single-seat pilots saw themselves as more capable since they performed all the tasks by themselves, affirming their flying skills and their masculinity. Gen Creech made a jibe to Phantom pilot masculinity due to the closeness to his back-seater: "I've never been against people breathing in my ear, but I didn't want it to come from a back-seater on a hot-mike intercom."[71]

Some former single-seat pilots who checked out in the Phantom allowed their cultural bias to override their potential effectiveness in battle. F-4 back-seater James Hendrickson

---

[69] Partisanship against the F-4 sustained for decades at Langley Air Force Base, the home of Tactical Air Command. The F-4 was conspicuously absent from a monument featuring four of TAC's single-seat fighters erected in 1985—over two decades after the F-4's introduction to the Air Force. Despite considerable lobbying from F-4 veterans, the F-4 did not rank a memorial at Langley until 1997. Dave Bragg to William F. Andrews, "Langley AFB Memorials," E-mail message to author, April 23, 2009.

[70] Colonel Hill recalled "the front seaters even had a pet nickname for us. They called us 'GIB' they said it stood for 'Guy in Back.' We were proud to be a GIB.…however some years later I was flipping through a real thick *Websters*, and I happened to chance upon the word…and the definition they had in there was a 'castrated tomcat.'" Col Howard J. Hill, interview by Dr. James C. Hasdorff, July 12, 1991, 20-21, Air Force Historical Research Agency, Maxwell AFB, AL.

[71] Creech, interview, 54.

described this problem in 1973: "some people had come into the F-4 out of single-seat fighters. They had done it all before, and they figured they didn't need anybody back there. Their attitude was, 'Shut up, go cold mike [turn off the intercom], and when I need you I'll tell you.'"[72] Because he had special electronic warfare expertise desired by an F-4 unit, Hendrickson was one of the first navigators to check out in the Phantom in 1969. He assessed this as a more effective division of labor because weapons system officers brought unique systems expertise to the aircraft, and because navigators did not vie for control of the aircraft as pilots assigned to the back seat did. With two pilots, the junior man flew in back and presumably had little to offer the front-seater, who had more flying experience. When navigators joined the fighter force as back-seaters in 1969, they carved out a niche of unique systems expertise which served as their base of shared control. "It's a two man airplane, and if both people know their jobs, you're going to be able to do a better job than if just one guy is doing his job and the other guy is sitting back there…I think a navigator is much better suited to the backseat, not because a pilot couldn't do the job but because a pilot is interested in flying the airplane….A navigator, because he knows he's never going to be moving out of that position, has a tendency to spend a little more time on his job and try to become a little more professional." [73] F-105F electronic warfare officer Jay Jensen expressed a similar professional pride in his supporting role; after running a thorough and meticulous ground checkout of the navigation and electronic countermeasures systems he waited on his pilot and the

---

[72] Ellis provides the front seat perspective on the same situation, which indicates poor training on crew coordination in the early days of the F-4: "as a single seater, I got in the F-4. And I never learned how to use that guy in the back seat, the pilot, I mean." Capt James L. Hendrickson, interview by Maj Lyn R. Officer and Hugh N. Ahmann, January 31, 1973, 60-61, Air Force Historical Research Agency, Maxwell AFB, AL; Maj Gen Billy J. Ellis, interview by Hugh N. Ahmann, February 1991, 40, Air Force Historical Research Agency, Maxwell AFB, AL.

[73] Hendrickson, interview, 14.

rest of the formation, "satisfied, I sat back and tried to relax a little and enjoy the ride."[74] The attitudes of these professionals emphasized their unique expertise in aircraft and electronic warfare systems and acknowledged their limited agency, which sharply contrasted with the frustration expressed by pilots assigned to the back seat who expected to be, and deeply wanted to be in control and up front. Chapter Nine, covers fighter force developments after 1968, and explores the dynamics of the pilot-navigator team and the resultant shift in fighter culture.

Rivalry between aircraft types could serve to inspire higher performance, but excess partisanship could also discount the potentially valuable perspectives of others. Advice or suggestions coming from an aviator from a different weapons system might be dismissed. When F-105 pilot Ronald Bliss initially arrived in Thailand, he crossed paths with several F-4 pilots awaiting transportation back to the States after completing their combat tours: "they were a year ahead of us. They had seen it." Although Bliss acknowledged their greater combat experience, he discounted it because the pilots were from another weapons system. "They were in F-4s, which at that time they weren't doing too much. They got us over and told us some of the horror stories about how many Thuds they were shooting down. We said, 'No sweat; we can handle that. We're Thud pilots. We're not wimp F-4 pilots with two guys and two engines. We can handle this stuff.'"[75]

Bliss' and Creech's feminization of their two-seat, two-engine F-4 counterparts sprang from their blinding self-confidence and idealized masculine self-images as fighter pilots. They saw the self-reliance of single-seat pilots as an affirmation of their piloting skills and an affirmation of their masculinity. P.K. Robinson, a single-seat F-100 pilot actually reveled in his

---

[74] Jensen, *Six Years in Hell*, 33.

[75] Bliss, interview, 33-34.

aircraft's flaws as an affirmation of his own proficiency as a pilot. The F-100 "was a real airplane. It's a pilot's airplane. You really had to know how to fly to fly it right. It had some characteristics that, if you didn't fly it right, it would kill you, in landing and in the air. It would get in a spin, and once you got into it, you may not be able to get it out. On landing, there were four or five ways you could kill yourself." Robinson's ability to control such an aircraft was an obvious source of pride. He believed that through his piloting skills, he could compensate for the aircraft's faults. "But it was single-seat, single-engine, and it flew really well. Obviously, by today's standards, it was underpowered, and it couldn't do a lot of things, but it was a great airplane to fly." By flying a difficult aircraft well, pilots maximized their sense of control and validated their flying skills to themselves and their peers.[76]

Strong records of success shaped fighter pilots in a series of intensely competitive environments, but could lead to blind spots if not brash overconfidence in one's plane, one's training, or one's abilities. Instilling a high degree of confidence was an intentional element of fighter pilot acculturation. Lt Col Jon Black recalled a question posed by his instructors in F-4 training. "They said, 'Okay, here is the situation. A flight of four F-4s, [over North Vietnam in Route] Pack I. Lead rolls in and takes a hit. Two rolls in and takes a hit. Three rolls in and takes a hit. You are number four; what do you do?' The right answer was if you had the right fighter pilot mentality or attitude was, 'I'm going to roll in because they aren't going to hit me. I'm a fighter pilot.'"[77] This hyper-confidence came from finely-honed flying skills, and confidence and allegiance in a machine (regardless of any shortcomings) that represented the pinnacle of

---

[76] Col Paul K. Robinson, interview by Dr. James C. Hasdorff, August 10, 1991, 10, Air Force Historical Research Agency, Maxwell AFB, AL.

[77] Lt Col Jon D. Black, interview by Dr. James C. Hasdorff, August 1, 1991, 78-79, Air Force Historical Research Agency, Maxwell AFB, AL.

advanced technology and mechanistic beauty. Black, who was shot down October 27, 1967, further reflected on flying fighters in terms that emphasized the power associated with flying a fighter and confidence in one's control over events to the point that they overshadowed evidence to the contrary. "There is an aura that goes with those two words, 'fighter pilot.' You are really something. You are invincible. You have got this magnificent machine, and you can cause all kinds of destruction, but they will never get you. They will never get you."[78] Rolling Thunder put this brash self-confidence to the test and fighter crews had to reconcile their aura of invincibility with the reality of substantial losses posing a motivational challenge addressed in the next chapter.

Although TAC was a backwater throughout the 1950s and early 1960s, its planes and pilots came to center stage with the opening of the Rolling Thunder campaign against North Vietnam in March 1965. In 1964 Dean Hunter was assigned to the wing staff at Kadena Air Base, Okinawa after completing a combat tour in South Vietnam flying the T-28 (an armed trainer) in Operation Farm Gate. The Kadena wing commander asked Hunter to prepare a briefing on the combat conditions in Vietnam for the wing's F-105 pilots. His briefing to Lt Col Robinson Risner's 67th Tactical Fighter Squadron was not well received: "the F-105 jocks literally laughed me out of their briefing room." Hunter only briefly flew the F-105, but "those pilots insisted that I was not a true fighter pilot because the VC had only been shooting arrows and throwing spears at me for the past year.…What they knew about Vietnam and combat techniques at the time you could place on the point of a pin. After my reception in the 67th TFS I decided to not even bother with the other two Thud squadrons."[79] Risner's pilots, planes, training, and confidence would be tested against considerably more than "arrows and spears" barely three months later as part of the first strike in Rolling Thunder.

---

[78] Ibid., 79.

[79] Hunter, *For Love of Life and Country*, 297.

Chapter 3: Operation Rolling Thunder

On March 2, 1965, U.S. Air Force aircrews participated in the opening round of Operation Rolling Thunder, a bombing campaign against North Vietnam that would extend across three and a half years. The operation opened with a successful but costly strike against two targets in North Vietnam when mixed forces of U.S. Air Force F-105s, F-100s, and B-57 light bombers and Vietnamese A-1s struck an ammunition depot and barracks complex at Xom Bang, and the naval base at Quang Khe. At Xom Bang, USAF fighters and bombers bombed North Vietnamese barracks and ammunition storage, as a portion of the fighters bombed antiaircraft guns and patrolled for MiG fighters. RF-101 photo planes followed the mission with post-strike photography and KC-135 air refueling tankers supported the fighters by orbiting nearby to provide fuel.[1]

The strike on Xom Bang was poorly planned and executed revealing USAF esprit but inexperience. The F-100 force arrived late over the target, impacting the F-105s, scheduled by headquarters to immediately follow. Lt Col Robinson Risner, a Korean War ace, led the F-105s but his squadron was inexperienced in the theater, having arrived in Thailand in late February. Waiting for their turn to attack, they loitered over hostile territory, during which "the gunners got all primed for us, and they just shot the stuffings out of us."[2] The flak suppression crews tried to protect the other flights, but suffered multiple hits in low altitude attacks. F-105 pilot Carlyle

---

[1] Jacob Van Staaveren, *Gradual Failure: The Air War Over North Vietnam, 1965-1966*, The United States Air Force in Southeast Asia (Washington, DC: Air Force History and Museums Program, 2002), 84.

[2] Risner, interview, 89-92.

Harris recalled "three of my squadron mates were shot down that day. All of those planes were damaged while they were at low level flak suppression."[3] The hard-hit flak suppressors paved the way for successful strikes on the North Vietnamese facilities, which sustained 75-80 percent damage, but the price was high for this success—antiaircraft fire claimed three F-105s and two F-100s.[4]

Efforts to recover the downed pilots were chaotic as planes covering the survivors ran low on fuel and several pilots tried to talk over each other on the emergency radio frequency (called the "guard channel" or simply "guard") making it unusable. Risner remarked "the radio discipline was the poorest I have ever heard. Everybody and his brother was on guard channel. We couldn't get a helicopter to come over and pick up the guys."[5] Rescue crews piloted a pair of helicopters and an HU-16 amphibian through the chaos to save four of the pilots, but 1st Lt Hayden Lockhart became the Air Force's first prisoner of war (POW) destined to spend nearly eight years in North Vietnam.[6] At Xom Bang, Air Force pilots attacked with individual skill, but without effective orchestration between attack elements. The Air Force headquarters in Saigon had called for attackers from different bases to attack the same target in succession, but this proved too difficult to execute. Trained primarily in single-aircraft nuclear strike, and elementary air-to-ground gunnery, the F-100 and F-105 pilots had little or no experience flying as part of a large multi-squadron attack force, revealing limitations of the Air Force's nuclear legacy. But the

---

[3] Col Carlyle S. Harris, interview by Capt Mark C. Cleary, November 16, 1982, 28-30, Air Force Historical Research Agency, Maxwell AFB, AL.

[4] Hobson, *Vietnam Air Losses*, 15.

[5] Risner, interview, 89.

[6] Robert L. LaPointe, *PJs in Vietnam: The Story of Airrescue in Vietnam as Seen Through the Eyes of Pararescuemen* (Anchorage, AK: Northern PJ Press, 2001), 90-96.

pilots demonstrated a vigorous spirit of attack and desire to accomplish their mission by flying multiple high-risk passes at low altitude within the range of antiaircraft guns to destroy the target.

From these opening shots fired at Xom Bang to the end of Rolling Thunder three and a half years later, five wings of Air Force fighter crews—about 3,300 men in total—risked their lives to bomb targets in North Vietnam. These men believed in the purpose behind their missions; they had trained to fly against America's enemies and felt an obligation to use the power of their aircraft and their own highly-developed flying skills to wage war against the seat of enemy power in North Vietnam. Their competitive spirit compelled them to do their utmost to attack their targets. But Xom Bang was little more than a pinprick, conducted against a minor military facility, and as the campaign slowly escalated, the crews felt tightly constrained by their chain of command in what targets should be attacked, when and how they should be hit creating doubt and frustration with their leaders. This imposed restraint chafed against these aviators' desire to exercise the fullest measure of the power, control, and freedom of flight they first experienced in flight training. As these men experienced tension within their own chain of command, the North Vietnamese built an ever more deadly air defense system to ward off aerial attacks. A seesaw battle ensued, that pitted competing technologies, ingenuity, and willpower. Within this contest, American airmen sought a balance between their enthusiasm for the missions they were assigned and the risks of carrying out these missions in the face of improving enemy air defenses. How these men interacted with the technology of aerial combat, and balanced the competing demands imposed by their missions, higher authority, and the risks of battle provide a window into their motivation, and are the focal points of this case study.

Operation Rolling Thunder

The attack on Xom Bang and the initiation of Rolling Thunder was a major escalation for the United States in Vietnam. The Air Force had been fulfilling support and advisory roles in Vietnam continuously since the French defeat at Dien Bien Phu in 1954, but avoided direct combat operations.[7] When insurgent violence escalated in South Vietnam in 1964 and 1965, President Johnson turned to the Air Force and the Navy for an aerial response. Reprisal raids, named Flaming Dart took place in February 1965, soon followed by Rolling Thunder raids in March. Rolling Thunder sought to interrupt the flow of men and material into South Vietnam, to coerce North Vietnam's leaders into abandoning their support for the war in the South, and to bolster the flagging morale of the South Vietnamese regime.

Originally envisioned as an operation of only a few months, Rolling Thunder ultimately stretched across three and a half years. Tentative early strikes in 1965 grew into a wider bombing campaign through 1966 and 1967. Air Force and U.S. Navy fighter crews carried out the attacks on North Vietnam; USAF fighters originated from bases in Thailand and South Vietnam, and Navy strikes launched from aircraft carriers operating in the Gulf of Tonkin. Thailand-based wings operated F-105s from Korat and Takhli Air Bases, and a wing of F-4s operated from Ubon Air Base. A reconnaissance wing at Udorn Air Base, Thailand operated camera-equipped RF-101 and RF-4s, which were joined by additional F-4 fighters in 1967. An additional wing of F-4s operated from Danang Air Base, South Vietnam.[8] An intense contest for air superiority over

---

[7] Robert Frank Futrell, *The Advisory Years to 1965*, The United States Air Force in Southeast Asia (Washington, DC: Office of Air Force History, United States Air Force, 1981), 17, 80.

[8] These fighter aircraft were joined by a variety of additional aircraft including the B-57 light bomber, EB-66 electronic countermeasures aircraft, KC-135 air refueling tankers, lightweight F-104 fighters, and EC-121 surveillance aircraft also located at bases in South Vietnam and Thailand. The wings in Thailand were oriented primarily on Rolling Thunder, but also provided sorties for operations over Laos. The wing at Danang divided its attention between Laos, North Vietnam, and an important close air support mission in South Vietnam. A second South Vietnam-based F-4 wing at Cam Rahn Bay occasionally added sorties to

North Vietnam featured prominently in the campaign's two middle years (1966 and 1967), which were characterized by a technological contest of wills between U.S. Air Force and Navy aircraft and aircrews against a North Vietnamese air defense network of radars, antiaircraft artillery, surface-to-air missiles and MiG fighters connected through a centralized command and control system. At home and abroad, the campaign was controversial and the Johnson administration faced mounting criticism as the bombing continued month after month. The campaign reached a crescendo in early 1968, when a country-wide insurgent attack in South Vietnam—the Tet offensive—rocked American commanders and policymakers with its surprise and scope. As the Seventh Air Force commander and his staff in Saigon (responsible for Air Force operations in Southeast Asia) diverted sorties from Hanoi to halt the offensive in the south, Washington restricted bombing to North Vietnam's southernmost provinces south of the 20th parallel and placed Hanoi, Haiphong, and important lines of communication to China off limits. Then, in a televised national address on October 31, 1968 President Lyndon Johnson ended the campaign. The President directed a bombing halt and put North Vietnamese skies off limits ending the three and a half year campaign five days before the Presidential elections.[9]

The Rolling Thunder case study that follows features three chapters that describe the missions, risks, and motivations experienced by USAF fighter crews in Southeast Asia. This chapter first describes how pilots and electronic warfare officers experienced the bombing mission and how the technical aspects of flying and emotional and physical distance between

---

support Rolling Thunder. These fighter wings operated between fifty-four and ninety fighters manned by 100 to 250 pilots per base. The mid-1967 USAF force levels are depicted in Appendix, 1, Figures 1 and 2: U.S. Air Force Order of Battle, 1967. Lee Bonetti, *The War in Vietnam, January - June 1967*, CHECO Contemporary Historical Evaluation of Combat Operations, Figures 1, 2, Air Force Historical Research Agency, Maxwell AFB, AL.

[9] Neil Sheehan, "Attacks on North Vietnam Halt Today; Johnson Says Wider Talks Begin Nov. 6," *New York Times*, November 1, 1968, 1.

crew and target quelled many potential doubts. Although there were growing antiwar sentiments back home, the doubts many fighter crews felt were directed towards their own leaders due to a tension between the crew's expansive perspectives on their mission and unpopular limitations imposed by senior policy-makers in Washington, Honolulu and Saigon. The subsequent chapter describes a second tension that grew between crew's perspectives on their mission and the risks generated by North Vietnam's air defense network and how tactics and technology reduced some of that tension but required pilots to surrender some of their cherished freedom and autonomy. The third and final chapter of this case study details the motivation that committed men to risk their lives and subject themselves to authority they did not respect, for a cause that became increasingly unpopular at home and abroad.

Flying Fighters Over North Vietnam: "Down We Went!"

These men experienced combat unlike anyone had experienced it before. Aircraft technology reached a performance plateau in the years between the Korean War and Vietnam and American aviators entered battle at the dawn of a new era of aircraft performance. Early jets used in Korea could reach high subsonic speeds (above five to six hundred miles per hour) for brief periods, only at high altitudes where the air was thin, or in a descent.[10] Starting with the F-100, in the late 1950s, aerodynamics and engine technology produced operational aircraft able to operate for extended periods of time just below the sound barrier, and could operate above the sound

[10] Most American jets in Korea were straight-winged and powered by weak early jet engines. Even the swept-winged F-86 Sabre was limited by its J-47 engine, which produced only 5,900 pounds of thrust, about one third of the 15,000 pounds produced by each of the F-4's *two* powerful J-79 engines. Marcelle S. Knaack, *Encyclopedia of US Air Force Aircraft and Missile Systems* (Washington DC: Office of Air Force History, United States Air Force, 1978), 80.

barrier for short intervals.[11] This plateau remained relatively steady for roughly forty years until the introduction of the F-22 Raptor in 2005 enabled prolonged fighter operations well above the speed of sound.[12] John Flynn flew P-51 Mustangs in World War II, early jets in Korea, and the F-105 in Rolling Thunder and believed the speeds set the war over North Vietnam apart from his previous experiences: "I can't really describe the adrenaline that you used up going into that combat arena because you were moving in at speeds you had never moved in combat before.…It was dry mouthed all the way, and when you pulled off the target, you would reach for your package of Pall Malls and a jug of ice water, and you would drink deeply of that. You wanted to smoke the whole pack, but by the time you got through half of it, you could settle down to refuel and come on home."[13]

Although jet speeds had reached new levels at the outset of the war in Vietnam, aviation electronics (shortened to avionics) that could ease a pilot's workload at high speeds had more in common with primitive World War II and Korean War avionics than they did with the computerized displays featured on contemporary fighters. Unlike electronic displays associated with modern perceptions of "Nintendo War," (a term used after the 1991 Gulf War that likened high-tech displays to contemporary video games), Vietnam-era displays were crude and difficult to interpret. At the outset of Rolling Thunder, crews experienced war at six seconds per mile without modern displays and scopes designed to make their jobs easier. Without the benefit of guided weapons and advanced displays available late in the war, fighter crews used dive-bombing

---

[11] The generation of aircraft from the F-100 through the F-111 was named the "Century Series" for their numerical designations. This generation of aircraft represented a leap in aerodynamic capability. The Air Force initially designated the F-4 Phantom the F-110, a designation that was dropped to keep a common designation with the U.S. Navy version of the Phantom.

[12] "F-22A Raptor Goes Operational," *Air Force Print News Today*, December 15, 2005, accessed July 17, 2010, http://www.af.mil/news/story.asp?id=123013572.

[13] Lt Gen John P. Flynn, interview by Lt Col Arthur W. McCants Jr., February 28, 1980, 134-135, Air Force Historical Research Agency, Maxwell AFB, AL.

attacks over Hanoi that had much in common with the tactics used over Normandy twenty years earlier.

Lt Col Risner's pilots used dive-bombing tactics on the Xom Bang raid and throughout the campaign because it was the most accurate means available to fulfill their mission. Pilots began their approach to the target from either medium altitude or from low altitude followed by a short climb (called a pop-up) to medium altitude to spot and then align with the target. The flight leader was responsible for navigating the formation to a planned roll-in point about two miles from the target to begin the dive. A sharp roll over and high-G pull turned the plane to align it with the target and achieve a steep 45-degree dive. F-4 pilot Mike McCarthy described his first dive attack in Rolling Thunder. "Down we went! Airspeed 450 knots, dive angle OK, pipper about where I thought it should be, and release altitude coming up...rapidly! I pickled (pressed the release button on the control stick) and started a four to five G pull-up as I felt the bombs leave the aircraft with a big thump."[14] With the nose pointing at the target and the plane accelerating to 450-550 knots, pilots like McCarthy concentrated on the target, viewing it through thick bulletproof glass and a reflecting bomb sight with an illuminated circle and dot (called a "pipper") for aiming, but had to control the other relevant parameters—airspeed, dive angle, and altitude—that affected the accuracy of an attack.

Pilots planned attacks for five seconds of steady tracking in the dive with the intent to simultaneously achieve a preplanned altitude, airspeed, and dive angle with the pipper superimposed on the target (which all unfolded, as McCarthy noted, "rapidly!"). If all went well, the pilot then pushed the red bomb-release button on the top of the control stick (the "pickle button"), and felt a series of heavy thumps as the bombs were released, followed by another sharp

---

[14] Mike McCarthy, *Phantom Reflections: The Education of an American Fighter Pilot in Vietnam* (Westport, CT: Praeger Security International, 2007), 38.

pull to get away from the target area, avoid the blast of the bombs just released, and to pull out of the dive. The pullout was a relief because the plane and pilot were vulnerable to ground fire after five long seconds tracking the target. "From the time your pipper is almost on the target until you release, you are on a railroad track, and all they have got to do is plan it and pull the trigger."[15]

During the pullout, pilots often rolled into a steep bank to look back at the target and observe the impact and detonation of their bombs. This was a habit that was rooted in fighter training, where pilots rolled over to assess the accuracy of their bombing passes on the gunnery range. There was a practical aspect of watching the training bombs hit, so the pilot could "go to school" after each bomb to improve the accuracy of the next run. Perhaps more significantly, there was a competitive dimension to scoring one's bombs from the air because fighter pilots normally placed bets on their bombing accuracy. Striving for their best performance, fighter pilots continuously compared themselves to, and competed with the other three pilots in a flight. Jack Broughton recalled that in training, "it was common to bet something like a nickel a hole for the ground-strafing target and a quarter a bomb for practice bomb displacement from the bull's-eye," although pilots would occasionally "up the ante to a quarter a hole and a buck a bomb."[16] With six to twelve practice bombs and one hundred rounds of twenty millimeter cannon shells, a handful of small change normally changed hands after each training mission. The competitive nature of the pilots attached far more value to the bet than the amount of money at stake.

During Rolling Thunder, just as on the practice bombing range, aircrews derived great satisfaction from an accurate attack that hit the point aimed at. Hits were a validation of a pilot's proficiency, added to one's self image, and appealed to one's professional pride. "When you blow

---

[15] Risner, interview, 93.

[16] Broughton, *Rupert Red Two*, 99.

up a missile a little flash of pride welled up in your heart. It was a simple matter of job satisfaction."[17] Direct hits, though were very hard to achieve with the unguided bombs prevalent in Rolling Thunder because any deviations in roll-in point, G forces, bank angle, dive angle, or airspeed required the pilot to compensate or else the bombs would miss. F-4 pilot Ed Cobleigh assessed that "it is extremely difficult to hit a small target with a dumb bomb dropped from a fast-moving airplane. Even small errors" in delivery parameters "produce large errors on impact."[18] Winds, defensive maneuvering, low clouds, and the demands of formation flying also induced errors. Minute adjustments to compensate for these errors had to be almost intuitive from repeated practice on peacetime practice bombing ranges because there was no time to think, analyze, and adjust while diving towards a target at nine hundred feet per second. Small misses were the norm, so Seventh Air Force in Saigon ordered formations of eight to sixteen or more fighters to attack small hard-to-hit targets.[19] Pilots could explain away small misses, but wide misses far from the target meant that someone (possibly themselves) would have to come back to the same target again, providing another layer of incentive.[20]

---

[17] George E. Day, *Return with Honor* (Mesa, AZ: Champlin Museum Press, 1990), 44.

[18] Cobleigh, *War For the Hell of It*, 195.

[19] Compensating for inaccuracy with large numbers suggests that the target should be worth the effort. Ed Rasimus incredulously recounted a mission where thirty-eight aircraft were sent against a suspected cache of fifty oil drums in a heavily defended area of Route Pack Six. "The pilots had all agreed in the planning room that we must have indeed been winning the war if we were sending sixteen [fighter-]bombers, four SAM-suppression aircraft, eight MIGCAP, two stand-off jammers, and eight tankers for fifty barrels of something buried at a jungle intersection. The briefing officer seemed a bit embarrassed by the target." Ed Rasimus, *When Thunder Rolled: An F-105 Pilot Over North Vietnam* (Washington, D.C: Smithsonian Books, 2003), 196.

[20] In 1967 and 1968 fighter experience levels dropped, and accuracy became a greater concern. F-105 Squadron commander Robert Smith noted that given his pilot's experience levels and Route Pack Six's heavy defenses "we couldn't expect excellence on average." Smith, "Robert W. Smith Autobiography," 195.

The most critical task during the pullout from a bomb run was the need to regain sight of the other aircraft in the formation. All fighter tactics were founded on the basic two-aircraft formation called an "element," which combined with a second element to form a four aircraft formation, called a "four-ship." At the beginning of the dive, four-ship formations fanned out to gain a few seconds spacing between aircraft so each could aim and concentrate on the target without risk of mid-air collision.[21] After pulling out of the dive, element leaders normally started a turn to allow their wingmen to cut inside their turn and rejoin the formation. Formation integrity was important because it maximized their ability to scan the skies for threats and it was the basis of many defensive tactics. In a formation, each pilot was assigned a primary sector to visually scan based on his position in the formation. Leaders, for example were responsible for scanning ahead, while wingmen were generally responsible for looking behind. Flights of four aircraft used more intricate, interlocking lookout assignments to protect the flight. Single aircraft were much more vulnerable as each man had to search 360 degrees, above and below on his own. One of the worst offenses a wingman could commit would be to not locate his leader coming off an attack and call the code word "blind" over the radio (which means "I do not have my flight leader in sight"). Until the elements and then the four-ship formation was back together, it was in greater danger with search sectors uncovered. There was the danger of a midair collision until flight members regained sight of each other, and flight members looking for each other were less likely to spot enemy threats. Radio calls to help a wingman spot his leader further jeopardized the entire force by occupying valuable time on the shared radio channel—during which critical threat warnings might be missed.

---

[21] For aircraft flying at 500 knots, separation of only five seconds equates to three quarters of a mile. Late in the campaign, some formations rolled in simultaneously to increase radar jamming effectiveness.

Because it heightened dangers to the flight and mission, calling "blind" was an embarrassment signifying a shameful and very public failure. Calling blind was a public self-admission of failure to every pilot on the radio frequency, calling into question a pilot's professional skills, reputation, and even masculinity (which will be expanded in Chapter Five on motivation).[22] Quickly spotting one's leader could be difficult, because a fighter only a few miles away would look like a small flyspeck near the horizon. Sighting was especially tough if the leader was "tail on" because the streamlined shape of jet fighters presented a small visual profile. G.I. Basel recalled the possibility of losing sight of his leader seemed worse than the enemy threat during his first attack over North Vietnam. "The worst thing a new pilot can do is lose his leader. It's an absolute NO-NO. I began to panic as I searched the mist," dreading the possibility of calling blind. "My career was on the line, the enemy forgotten." Then "I saw him then, a tiny gnat on the horizon, a fly-speck on the canopy. My hand relaxed on the control stick. I thanked God for being spared the stigma of being a lost wing-man."[23] Flying well and demonstrating that ability to one's peers to gain their trust and respect extended from the first days of pilot training through the last day of a flying career. The premium on proficiency became especially important

---

[22] Losing sight of one's leader and calling "blind" is an enduring embarrassment to a fighter pilot. A 2003 song by two F-16 pilots named "Two's Blind" indicates a common concern nearly forty years later:

> *We pushed to the target and lead said, "Just keep sight"*
> *But then he actioned [turned] left, when I swear to Jesus that he briefed right*
>
> *It's times like this when I feel a bit resigned*
> *To just fucking eject rather than admit that I am blind*
>
> *Dear God, what the hell have I done wrong?*
> *Is it 'cause I drink and smoke and cuss, and repeatedly stroke my schlong?*

Chris "Snooze" Kurek and Rob "Trip" Raymond, *Live at the Sand Trap* (Dos Gringos, 2003).

[23] Basel, *Pak Six*, 15.

in combat because the slightest momentary lapses could cost a man his life or the lives of his leader or wingman.

After an attack and once joined back together as a formation, there was little time for reflection. Aircrews could face considerable defenses after leaving the target area and had to remain vigilant. At other times, flight members would need to nurse battle-damaged aircraft back home, struggling to climb away from the ground and maintain control, or to retain sufficient thrust from a damaged engine. Liberated from the weight and drag of heavy bomb loads, crews would accelerate to very high speeds escaping from the target area. F-105 pilots especially sought to exploit the unique power of their aircraft on egress. G.I Basel recounted that "the Thud had speed. She could outrun any airplane in the world at that time, provided it was at medium or low altitude.…I found I could urge even more speed from her when I was scared spitless." On one mission, he had a difficult time keeping up with his flight leader as they left the target area at extremely high speed and low altitude. "We went out in full fast-re-heat plus adrenalin boost. I had my foot in the carburetor and couldn't keep up with Bob.

> *'Otter Lead. I can't catch you. What's your speed?'*
> *'A thousand miles an hour.'*
> *'Oh.'"*[24]

Fuel became a major consideration during such egresses because of the high fuel consumption at such high speeds and low altitudes.

High power settings, especially the use of afterburner could exhaust a fighter's entire fuel supply in mere tens of minutes. An afterburner rapidly pumps fuel into the engine aft section and ignites it. Producing a spectacular flame, the afterburner functions as a rocket motor to push the

---

[24] Although some of Basel's terms are intended to be tongue in cheek (the adrenaline is Basel's own, the F-105 did not have a carburetor, and may not have been able to reach 1,000 miles per hour), the passage suggests the speed and intensity of an F-105's run from the target area. Basel, *Pak Six*, 10, 48.

aircraft to very high, even supersonic speed, but the afterburner's rapid fuel consumption quickly empties a fighter's fuel tanks. Crews with low fuel states would try to make it to a tanker orbiting across the border in Laos or over the Gulf of Tonkin to get enough fuel to make it back to home base. Tensions were high as fighter crews sought to make an efficient and quick join up with the tanker for refueling. Maj Ken Bell experienced the war's most dramatic refueling, when his F-105 exhausted its fuel as he reached the tanker and he refueled in a steep glide without engine power in formation with the KC-135 tanker. When the refueling "nozzle moved into the receptacle, and the locking closed with a sharp clunk," Bell restarted his engine but was so drained by the tension that "I almost went limp."[25] Radar controllers across the border at Udorn Thailand, were responsible for facilitating the join ups and felt the tension on the toughest missions: "On particularly bad days, there were numerous emergencies and individual flights were split up....When living these missions, usually two a day, you had an hour or more of boredom and 5 minutes of extremely high pucker factor hooking up the egressing Thuds. There was other work at Udorn but nothing came close to that of hooking up egressing Thuds."[26]

After a successful post-strike refueling with the flight turned towards home, there might be a few minutes to relax before making a descent to landing. This would often be the time to savor the joys of flight; one was alive, safe and in control of a powerful fighter aircraft. Some flights dropped to treetop level and enjoyed low level flight, buzzing the Thai countryside. Some flights practiced important combat maneuvers like defensive "break" turns used against enemy

---

[25] Bell, *100 Missions North*, 229.

[26] "Pucker factor" is a slang reference to a puckered sphincter muscle resulting from high anxiety. Richard Letzkus, "Brigham," *505th Tactical Group*, accessed January 4, 2009, http://www.squawk-flash.org/stories/brigham_festus.htm.

fighters or missiles.[27] Others performed unnecessary aerobatic maneuvers reminding themselves of some of the enduring attractions of flight (freedom, control, and power) that led them to a cockpit in Southeast Asia.[28] Near the target, the pilots had just employed all of their fighter's freedom to maneuver through the air and power to get to the target, attack it, and escape. Now, in a safe environment, pilots could revel in the joys of flight and celebrate surviving a dangerous mission.

Approaching the base, flight leaders gently rocked their wings up and down signaling a shift to close formation and the need for precise flying and rapt attention. The pilots then maneuvered their jets to just a few feet separation from wingtip to wingtip as the formation approached the base in an open display of flying ability. During these few minutes "on initial" (or initial approach to the runway), the flight would be on display for the whole base to see. Pilot reactions, on the ground and in the air, underscore the ever-present desire to fly well and to demonstrate that ability to one's peers. Pilots on the ground below would reflexively interrupt what they were doing to look up to first count the aircraft to see if any did not return. Next, they scrutinized the precision and steadiness of the flight, and then counted the seconds between each plane breaking off for landing, comparing this display of airmanship to their own formation flying. In the words of one F-4 pilot from Ubon: "knowing everybody on the ground is watching, they want to make it look good."[29] Although these men had just cheated death over Hanoi, the premium they collectively placed on excellence demanded a crisp and exact landing pattern.

---

[27] Robin Olds directed his wing to practice critical combat skills for five to ten minutes each mission on the way home to fill in training gaps and refine tactics. Col Robin Olds, interview by 2Lt Charles Heffron, July 12, 1967, 5-6, Air Force Historical Research Agency, Maxwell AFB, AL.

[28] On a boring night patrol on Christmas Eve, Ed Cobleigh recounted performing a slow roll before returning to base. "Stupid? Yes. Fun? Also Yes. A night slow roll is my Christmas present to myself." Cobleigh, *War For the Hell of It*, 119-120.

[29] Spike Nasmyth, *2355 Days: A POW's Story* (New York: Orion Books, 1991), 7.

Constant mutual surveillance meant that their professional reputations were at stake every time they took to the air. A solid formation, evenly spaced, and a precise five second interval between the turns to break up the flight signaled a proud return to the base. A sloppy formation, irregular spacing, or bouncing around would be black marks, resulting in mental notes of poor, unprofessional, or sloppy airmanship among a group of critical and competitive peers.[30]

After landing, aircrews returned the aircraft to the maintenance crews, debriefed maintenance on problems and then provided a thorough mission debriefing to unit intelligence. Intelligence officers were keen to report defenses encountered (with times and locations) unusual observations, and attack results. Intelligence recorded attack parameters, including altitude, airspeed, and dive angle along with the crew's assessment of where their bombs hit, and what effect they achieved.[31] Accurate bomb impacts and the ensuing spectacular explosions were the pay off. Secondary explosions (extra detonations of explosives or fuel), indicated the attack hit something of value. F-100 pilot George "Bud" Day led multiple strikes in Route Pack One and wrote that "if you strike a truck and saw it burn it was tangible."[32] "Secondaries" would not only validate one's pilot skills, but they also meant the mission was meaningful by indicating the destruction of a significant enemy resource.

These men enjoyed flying their powerful fighters to their greatest potential. When they flew well, performed their formation duties expertly, and stayed calm under stress, they lived up to the idealized fighter pilot image they carried in their heads. They also proved themselves worthy of their peers' respect, gaining honor, avoiding shame, and affirming their masculinity,

---

[30] Bach, *Stranger to the Ground*, 73.

[31] Paul Darien Berg, "Assessing the United States Air Force Bombing Effectiveness During Rolling Thunder" (Ph.D. dissertation, Auburn University, 2001), 45-61.

[32] Day, *Return with Honor*, 44.

which boosted their motivation. However, their motivation was challenged when the missions became frustrating, authority became overbearing, and the risks posed by Vietnam's air defenses became daunting, as the remainder of this case study will describe.

Mission: "We Looked Forward to Busting up a Lot of Concrete"

Fighter crews were eager to carry out their bombing missions in Rolling Thunder, which were intended to undermine North Vietnam's ability and will to support the war in the South. Attacks against three general target types: infrastructure, war materials, and air defenses dominated the campaign. Crews believed all three target types were valid military objectives and that their missions into North Vietnam struck directly at the source of the war, and the better that they could carry out their missions, the more quickly the war would be over. Washington's restraint in approving targets near Hanoi frustrated American pilots who generally believed the bigger the target and the closer it was to Hanoi, the greater its importance and value to the North in fighting the war. Contingents of international peace activists captured page one press coverage, and public criticism of the bombing heated up after a *New York Times* correspondent reported on bomb damage from North Vietnam in December 1966, but American pilots believed that their missions could help win the war efficiently by going after visible sources of enemy strength in the North and remained committed to the bombing. This section describes how, despite public criticism of the bombing, the technical nature of the bombing missions kept airmen physically and mentally distant from the human impact of their bombs, the speed of their aircraft left little time for questions of conscience, and how regard for collateral damage and headquarters directives and limitations reinforced the legitimacy of the bombing missions in the eyes of the men who carried them out.

Rolling Thunder's most prominent and controversial targets were the stationary facilities that constituted a large part of North Vietnam's war-making capability, such as factories, oil storage and power plants. These fixed targets also included the North's transportation infrastructure and included, most visibly, rail lines, rail yards, bridges, supply depots, and as the war went on truck parking areas (or "truck parks"). Despite the dangers, pilots itched for the opportunity to strike major targets near Hanoi in the belief that their destruction would speed a conclusion to the war. Prevailing attitudes held that it was better to strike at the source of communist support than to fight insurgents one at a time in the South. Maj Jim Kasler led his wing's first strike against Hanoi in June 1966 and likened the attack on a prominent oil storage facility to World War II's legendary but costly raid on the Ploesti refinery in Rumania. Kasler wrote "every fighter pilot dreams of leading a mission of this importance, but few ever have the opportunity," underscoring the fighter pilots' eagerness to knock out the big, important targets.[33] It is unlikely that every pilot actually dreamt of such a mission, but to Kasler, every fighter pilot *ought* to dream of such an opportunity. The crews who flew over the North believed that Vietnam's few industrial targets should have been hit quickly to deny their materials to the communist war effort. Likewise, fighter crews itched to shut down North Vietnam's most prominent transportation nodes including bridges, rail yards, and harbors to staunch the flow of supplies from the rest of the communist bloc to Hanoi, but the President's fear of escalation led to tight control of the target list, and Washington slowly and incrementally released targets to the Joint Chiefs for attack to the great frustration of the men carrying out those attacks.

The second type of target was the war material that moved along the lines of communications and the vehicles that moved it. Trucks, trains, and boats were obvious elements

---

[33] Col James H. Kasler, "The Hanoi POL Strike," *Air University Review* (December 1974).

of the system. Supply caches, choke points, and dispersal sites along supply routes also garnered considerable attention. Trucks were the subject of an immense cat and mouse effort where aircrews tried to find and destroy trucks which often hid by day and traveled by night. War materials were clear-cut military targets and crews were eager to engage them, but countless missions against suspected sites led to frustration and a sense of futility. Fighter crews took off with instructions to strike preplanned targets such as supply caches (suspected fuel stores and truck parking areas were especially prevalent), but pilots remained vigilant for moving vehicles and attacked them when they spotted them. As Kasler led his flight towards home after the Hanoi oil strike, he spotted a newly constructed road. "Investigating, I popped over the rim of the plateau and dropped my nose; there, directly under my gun sight pipper, was a truck. I squeezed the trigger, and the 20-mm cannon shells tore into the truck, setting it on fire. All told, we found 25 trucks on the plateau. We set twelve afire and damaged at least six others." For his aggressive leadership on this very productive mission, James Kasler received the first of his three Air Force Crosses—the only airman to earn his service's second highest decoration three times.[34]

This type of attack, against an unplanned "target of opportunity" characterized much of the bombing effort in the southern provinces of North Vietnam, where there were few valuable fixed targets but there were several lines of communication leading to South Vietnam and the Ho Chi Minh Trail in Laos. These unstructured attacks against war materials inside North Vietnam appealed to fighter crews because they allowed airmen to exercise freedom and local autonomy in a hunt for the enemy. But Kasler's attack against a target of opportunity, in the vicinity of Hanoi, became exceptional in the latter half of the campaign due to the risks of lingering in highly

---

[34] Perry D. Luckett, *Tempered Steel: The Three Wars of Triple Air Force Cross Winner Jim Kasler* (Dulles, VA: Potomac Books, 2005); Kasler, "The Hanoi POL Strike."

defended areas, changing perceptions of the utility of taking such risks, and the increasingly restrictive rules pilots operated under, which will be detailed later in this chapter.

A third and special category of target was People's Army of Vietnam (PAVN) air defense network. North Vietnam's air defense system of early warning radars, antiaircraft guns, surface-to-air missiles, MiG fighters and MiG bases occupied a special place in the American aircrew's psyche. The destruction of an air defense target, more than any other type of target, could lead to fewer friendly aircraft losses. Victory over a MiG fighter in the air garnered respect and admiration; five such victories conveyed the coveted title of "ace." Capt G.I Basel voiced an eagerness to strike the MiG base northwest of Hanoi when he was assigned to hit a target near it: "we wanted the Phuc Yen airfield in the worst way, but some unexplained high level restraint kept us away from that target. This caused a lot of pilot anger. MiGs were taking off from Phuc Yen and giving us fits. It was the primary fighter base in the north and was operating with immunity. It made sense to us—Bomb Phuc Yen, the air base, not the rail yard."[35] Ken Bell recorded the excitement he felt when Kep air base was authorized as a target in June 1967: "The thrill of making a surprise attack, and the lure of MiGs far outweighed the risk of being shot down only days before finishing my tour….Even if the MiGs escaped we looked forward to busting up a lot of concrete." After the attack, Bell recorded in his diary: "It's odd the pleasure a fighter pilot takes in bombing an airfield."[36] Crews commonly described their attacks against air defense targets as attacks on objects: MiGs, runways, SAMs or guns. Bell and his peers saw the utility of destroying North Vietnam's air defenses, war materials, and infrastructure, but Rolling Thunder sparked an international furor over the morality of the bombing.

---

[35] Basel, *Pak Six*, 34.

[36] Bell, *100 Missions North*, 266-270.

International protests registered in U.S. newspapers within days of the first raids on North Vietnam, and domestic protests began to decry the bombing within weeks.[37] Public criticism escalated sharply in December 1966 when North Vietnam granted *New York Times* correspondent Harrison Salisbury a visa to report on the destruction in the North. Salisbury's initial reports from Hanoi described the intermingling of military targets in civilian neighborhoods, but his tone turned strongly against the bombing after visiting the town of Namdinh, 60 miles south of Hanoi: "whatever the explanation, one can see that United States planes are dropping an enormous weight of explosives on purely civilian targets."[38] American aircrews discounted Salisbury's reporting, which they viewed as a mouthpiece for Hanoi's propaganda. F-105 pilot John Piowaty wrote in 1983 that "in spite of Harrison Salisbury's beliefs, we caused very little collateral damage. There were plenty of antiaircraft artillery batteries in villages, but many of them came alive only after we passed overhead. I would imagine that at least as many tons of Russian shrapnel fell on North Vietnam as did American bombs."[39] A U.S. Navy attack squadron commander, who had led attacks on Namdinh, found Salisbury's report "simply unbelievable" and described the major military targets clustered around the town, and its heavy antiaircraft defenses that went unmentioned in Salisbury's report. The commander did not question Salisbury's truthfulness, but illuminated a key point that enabled most airmen to carry out their

---

[37] "Canada Students Protest Bombing," *The Washington Post, Times Herald*, February 10, 1965, 15; Jack Raymond, "VIGIL AT PENTAGON SCORES BOMBINGS," *New York Times*, May 13, 1965, A1.

[38] Harrison E. Salisbury, "U.S. Raids Batter 2 Towns; Supply Route Is Little Hurt," *New York Times*, December 27, 1966, 2.

[39] Alternative reporting stressed the accuracy and low casualties caused by the bombing. A typical exchange can be seen in the New York Times. See Neil Sheehan, "Raids' Precision Seen in Reports," *New York Times*, December 30, 1966; Harrison E. Salisbury, "Hanoi Propaganda Stresses Tradition: War Against Odds," *New York Times*, December 30, 1966. John Piowaty, "Reflections of a THUD Driver," *Air University Review* (February 1983).

missions without regrets: "he's describing what he's seen on the ground…I guess we're looking at it from different points of view." [40]

Air Force flyers believed in what they were doing and bombed targets in North Vietnam which they viewed as valid military objectives, but they also benefitted from a detachment from the intentional military or inadvertent civilian casualties they inflicted due to an aviator's view of the target. The perspective from a jet fighter generated physical and psychological distance between the crew and their target. As Rolling Thunder's pilots pulled away from an attack, they observed the spectacular flash from their heavy bombs, a circular shock wave of condensation, and a cloud of smoke—a very different perspective from that described by Harrison Salisbury on the ground in North Vietnam. Airmen saw the object of their attacks as material objects rather than men. Even attacks against North Vietnam's air defenses, which were manned by tenacious air defense troops, were viewed as attacks against systems or locations. Recalling the mission against a surface-to-air missile battery that earned him the Medal of Honor, Maj Merlyn Dethlefsen simply stated "I wanted to destroy that *site*."[41] Dethlefsen and his peers knew their bombing meant killing the enemy and at times, civilians due to their proximity to military targets, but this awareness did not present an obstacle for most. During Rolling Thunder, only one Air Force fighter pilot refused to fly in Southeast Asia for moral objections, and he lost a very public court martial battle in 1968.[42]

Scholars have debated American soldiers' willingness to kill their enemies, but American airmen demonstrated little reluctance to drop bombs on North Vietnam during Rolling Thunder.

---

[40] "A FLIER DISPUTES REPORT ON RAIDS," *New York Times*, December 29, 1966, 2.

[41] Author's emphasis. Lt Col Merlyn H. Dethlefsen, interview by Hugh N. Ahmann, December 20, 1971, 66, Air Force Historical Research Agency, Maxwell AFB, AL.

[42] Douglas E. Kneeland, "Capt. Noyd Is Sentenced to a Year at Hard Labor," *New York Times*, March 10, 1968, 3.

S.L.A. Marshall ignited a scholarly debate over American soldiers' willingness to kill their enemies in World War II with the publication of *Men Against Fire*, in which he claims "on average not more than 15 per cent of the men had actually fired at the enemy positions or personnel."[43] Marshall's figures on firing rates and supporting evidence have been refuted effectively by subsequent scholarship, but Marshall's notion of American soldiers as reluctant killers gained substantial support in Dave Grossman's *On Killing*, in which Grossman argues for the existence of a "powerful innate human resistance toward killing one's own species" that had to be overcome by "psychological mechanisms" in military training and organizations.[44] Grossman argues physical and emotional distance between killer and target provides "mental leverage" enabling one to kill.[45] This distance was a significant feature for fighter pilots in Rolling Thunder, who seldom saw their human adversaries. Distance enabled American airmen to kill, but so did the drive for perfection, precision, and control needed to complete a successful attack. The challenging technical aspects, which appealed to aviators, could overshadow the

---

[43] Marshall believed soldiers were reluctant to shoot because they were influenced by society's taboos on killing grounded in a man's "home, his religion, his schooling, and the moral code and ideals of his society." Marshall, *Men Against Fire; the Problem of Battle Command in Future War*, 54, 78.

[44] Historian Joanna Bourke argues the most widely varying position in *An Intimate History of Killing*, in which she contends ordinary people find pleasure in committing violence, and society gives them license to act on these impulses in wartime. Although that philosophical issue is beyond the scope of this dissertation, Bourke does identify several factors that she argues rationalize violence, which also have some continuity with Grossman's psychological enablers. Bourke's rationalizations include: obedience, reciprocity/revenge, depersonalization, and sportiveness which are supported by military superiors, and personal responsibility, which is not. Joanna Bourke, *An Intimate History of Killing: Face-to-Face Killing in Twentieth-Century Warfare* (New York: Basic Books, 1999), 1-2, 213, 358-364.

[45] Two significant rebuttals of Marshall include Fredric Smoler's "The Secret of the Soldiers Who Didn't Shoot," *American Heritage*, 40 (March 1989), pp. 40-45 and Roger J. Spiller's "S. L. A. Marshall and the Ratio of Fire," *RUSI Journal*, 133 (Winter 1988), pp. 63-71. For recent summary of the argument, see Peter R. Mansoor, *The GI Offensive in Europe: The Triumph of American Infantry Divisions, 1941-1945* (University Press of Kansas, 2002), 257-262. Grossman argues that in addition to distance, group support, and clear demands from authority enable violence. Lt. Col. Dave Grossman, *On Killing: The Psychological Cost of Learning to Kill in War and Society* (Boston: Little, Brown and Company, 1995), 99-140.

psychological dimensions and meaning behind the action. The many distancing elements helped keep the killing in war a technical matter that tested and showcased a pilot's proficiency and skill.

Killing was largely an abstract action for Rolling Thunder crews because most did not experience it up close, and because the piloting skills and precision needed to put a bomb on target dominated the experience. Unlike soldiers who might confront an enemy face to face at close range, airmen were more distant physically from the lethal dimension of their profession because aerial attack involved high speeds and long distances. Fighter pilots took a glance over their shoulder at their bomb's impact, but then left the area at 500 knots. To most, bombing in combat was far closer to practice bombing in peacetime than it was to the experience of close combat on the ground. Achieving the right speed, dive angle, height and putting the pipper on target were all-consuming activities. Just like on the practice gunnery range, pilots had to focus intently to achieve an accurate hit—a technical achievement rather than an act of killing. A Marine pilot who later turned to antiwar activism described the impact of this technical focus: "It was very much of a technical expertise thing. I was a good pilot, you know, I had a lot of pride in my ability to fly....During the missions, after the missions, the result of what I was doing, the result of this game, and this exercise of my technical expertise, never really dawned on me."[46]

The most prominent element of distance for airmen in Vietnam was the physical distance from the pilot to the target. This distance was normally so great that few pilots reported spotting enemy combatants during a Rolling Thunder combat tour. Bomb runs started, as noted, one to three miles above the ground and two to three miles from the target. From these distances, it was almost impossible to see a person. The speed of the attack (500 knots), the thick armored glass of the forward windscreen, the reflection of the illuminated bombsight, a short five-second bomb

---

[46] Peter Davis, *Hearts and Minds*, Criterion Collection (re-released 2002) (Criterion, 1975).

run, and the concentration required further hindered the ability to see people on the ground. Even during strafing attacks, which employed twenty millimeter cannon-fire from inside a half-mile range or less, few fighter pilots reported seeing enemy combatants on the ground during Rolling Thunder.[47] One F-4 pilot reflecting on his combat tour found it strange and worth recounting that, although he flew many missions at night, he could only remember seeing one human being in North Vietnam during his entire tour.[48] Another pilot sensed that "the countryside was deserted" from the cockpit of an F-105 traveling at 600 knots and 2,000 feet above the rice fields of North Vietnam.[49]

Although distance was a feature of attack from the air, it was not something crews intentionally sought to increase. In April 1966, the Air Force introduced ground-based radar control stations called "Combat Skyspot" to guide aircraft to high-altitude bomb-release points above the clouds during periods of poor weather. But fighter crews preferred to apply their piloting skills in more hazardous visual dive-bombing attacks over distant, safer high altitude radar-directed attacks. Fighters under the control of Skyspot's ground radar controllers followed precise headings relayed from the ground to a bomb-release point called over the radio from the ground. After "bombs away" the weapons fell through the clouds to an unseen target below and the fighters turned for home without any ability to observe their results. There could be few means that could provide more distance, but Skyspot drops were unpopular with fighter pilots and navigators because they were of questionable accuracy and because the pilots believed that they

---

[47] Pilots in South Vietnam flew close air support missions against enemy troops at low altitudes where it was more likely to spot the enemy during an attack. An account of a fighter pilot spotting enemy combatants and strafing them was written by an F-100 pilot operating over South Vietnam. See Lester G. Frazier, "Holiday in Southeast Asia," accessed April 27, 2009, http://www.lesfrazier.com/holi.htm.

[48] Val Ross Johnson, *Night Owl Fighter Pilot* (Lincoln, NE: iUniverse, Inc., 2006), 280.

[49] Bell, *100 Missions North*, 102.

did not require any piloting skill to carry out. Ken Bell's roommate grumbled when scheduled for "another crummy Skyspot." Fighter pilots preferred to attack by applying their piloting skills against targets of their own choosing. Lt Ed Rasimus believed that his flight leader, Capt Mitchell "hated Skyspots only slightly less than he hated lieutenants." Preferring to exercise his own control and piloting skills, Rasimus observed Mitchell drop only one of the five thousand-pound bombs carried by his Thud on the assigned Skyspot target, withholding the rest to go look for other targets that he could attack visually.[50]

Emotional distance accompanied the physical distance of aerial attack in Rolling Thunder. Most references to the enemy demeaned or dehumanized the North Vietnamese adversaries which created psychological distance. Because they seldom saw their North Vietnamese adversaries from the cockpit, aviators created imagined versions of their enemies. The language used by aviators seldom placed their adversaries on equal footing. J. Glenn Gray, in his 1959 meditation on war *The Warriors*, observes that when a soldier dehumanizes or views an adversary as subhuman, he frees himself from the remorse that might be attached to killing.[51] The racial distinction between American pilots and their Vietnamese adversaries, reflected in the aviator's language, suggests an aspect of this emotional distance. Although pejorative language is occasionally reflected in memoirs or oral histories from years after the war, "gook" and the more common "gomer" were common references in informal conversations.[52] Gook is a racist term of contempt, generally directed towards Asians in use since the 1930s.[53] The more common and

---

[50] Bell, *100 Missions North*, 44; Rasimus, *When Thunder Rolled*, 130-131.

[51] J. Glenn Gray, *The Warriors: Reflections on Men in Battle* (Harcourt, Brace, 1959), 148-153.

[52] "Gomer" became a ubiquitous term during Operation Commando Hunt's hunt for PAVN's trucks after 1968. Ed Cobleigh reflected on the use of "gook" as a dehumanizing caricature distancing him from his adversary. Cobleigh, *War For the Hell of It*, 112.

[53] "Oxford English Dictionary, gook," accessed April 4, 2009, http://dictionary.oed.com.

somewhat less pointed "gomer" may have had its origins in the 1960s TV series *Gomer Pyle, USMC* which depicted Gomer as "an ignorant rustic" trying to fit into the role of a U.S. Marine. More generally signifying "an inept or stupid colleague," gomer migrated to describe all enemy soldiers in Vietnam, especially among combat aviators.[54] Randy Cunningham, a U.S. Navy fighter ace, described an opposing MiG pilot in degrading terminology: "I turned to look the enemy pilot in the face—I could see the little Gomer inside [the cockpit] with his beady little Gomer eyes, Gomer hat, Gomer goggles and Gomer scarf."[55] For aircrews involved in bombing along the Ho Chi Minh Trail, an adaptation of gomer was expressed as the acronym "guy on motorable enemy route."[56]

Other language used by aviators indicated they held their adversaries in lower standing. Gen Wilbur Creech, served as an F-100 wing commander in Vietnam (before leading TAC in 1978), and through his criticism of Washington's bombing strategy voiced the belief that the North Vietnamese were incapable of receiving political signals from the American leaders directing the bombing. Washington "brought all this sophisticated nuance to the game, and the only thing those North Vietnamese understood—they were simple, peasant-minded zealots—was a blow in the solar plexus."[57] F-105 pilot Richard Baughn saw the same issue in more racially explicit terms: "you have got to kill more than an average amount, more than you do Caucasians to get their attention."[58] Degrading an adversary with language created emotional distance and

---

[54] "Oxford English Dictionary gomer, n.3," accessed April 4, 2009, http://dictionary.oed.com.

[55] Randy Cunningham, *Fox Two* (Mesa, AZ: Champlin Fighter Museum, 1984), 78.

[56] John Algeo and Adele Algeo, "Among the New Words," *American Speech* 64, no. 2 (Summer 1989): 153.

[57] Creech, interview, 126.

[58] Baughn, interview, 74.

facilitated killing. Because pilots seldom saw the North Vietnamese, their enemy was a largely imagined one. Racially-laden terminology and an emphasis on structures and machines as targets distanced this imagined enemy from American flyers, enabling their violent mission.

In the heat of battle, there was no opportunity for reflection on the effects of an aerial attack. Pilots achieving an accurate hit on the intended aim-point would experience a brief surge of professional pride and satisfaction, while disappointment or anger accompanied a miss. Either way, crews had no time to dwell on that reaction. Rejoining formation, fuel, battle damage, and air-defenses kept crews well occupied. Once clear of high threat areas, particularly Route Pack Six, a sense of elation accompanied another successful escape from some of the most heavily defended airspace in the world. After a harrowing brush with MiG fighters, G.I. Basel described the relief of escape: "the radio was still full of calls, but now they were different; laughter and relieved jokes." Once joined up, Basel's leader called for a check-in over the radio to call roll. "Everyone was there! You could hear the cheerfulness in the voices as we nuzzled up to the fat tankers for some precious gas to get home."[59] Refueling and a return to home base followed. A long cruise back to base and the safe environment of an air base, however, provided crews with a sanctuary and for some, the opportunity to consider the implications and morality of their actions in combat. G.I. Basel found it difficult to relish the thought of killing a MiG pilot in battle. "On the way home and out of danger, I thought about the MiG pilot: wondered if he'd been able to eject." His mixed feelings revived a guilty childhood memory. "I had the same feeling one time before, a long time ago. The tiny bird on the beach was so far away there was no way to hit it with a 22 pistol; yet, there it was, tiny and still in the wet sand at my feet, a small red hole in its

---

[59] Basel, *Pak Six*, 108.

back."[60] Like Basel, other aviators considered the morality of their actions when they were far from battle.

Aircrews had a variety of strategies available to reconcile their actions in battle with their personal morality. First, as directed from the highest levels, the Rolling Thunder bombing aimed at military targets and sought to minimize collateral damage to civilians. Concern for civilian casualties was a major rationale for sending fighters against North Vietnam instead of heavy B-52s. Airmen were supportive of the idea of limiting civilian damage and casualties, which resonated with the legacy of the Air Corps experience in World War II, where many airmen paid the ultimate price in the pursuit of daylight precision bombing.[61] Measures devised to limit North Vietnamese collateral damage and civilian casualties cost the U.S. planes and pilots over Vietnam as well. Richard Hamilton wrote "No one wanted to purposely bomb helpless civilians, but the North Vietnamese located anti-aircraft weapons in many of their villages because they knew they were safe from attack….I never attacked a village and I think I can vouch the same for every pilot in my squadron." But Hamilton was tempted to bomb a gun firing from a village, that drove off a rescue helicopter, leading to the capture of a Thud pilot. "Like most of the others I gritted my teeth and held my temper."[62] John Flynn, 388th TFW vice commander, affirmed the difficulties of minimizing collateral damage, "the rule, we generally agreed, was a good one. We didn't want to incur collateral damage." But he and wing commander Col Ed Burdette questioned the cost:

---

[60] Ibid., 88.

[61] In his study of American attitudes towards civilian casualties and bombing, historian Conrad Crane concluded that "in general most American airmen did the best they could to win the war with consistent application of a doctrine that favored military and industrial targeting over terror-bombing. Their intent was to spare civilians and they succeeded better than most historians are willing to concede." Conrad C. Crane, *Bombs, Cities, and Civilians: American Airpower Strategy in World War II*, Modern War Studies (Lawrence, KS: University Press of Kansas, 1993), 10.

[62] Hamilton, "Memoirs of Thailand - A Fighter Pilot's Journal," 32.

"'they expect us to go in and destroy the target as though we are a surgeon who must pluck the eye out of the face without a mark. I don't know how much longer we can stand that kind of thing.' We were taking losses in order to enhance the precision of our bombing."[63]

Attacks on clearly unoccupied structures including roads, railroads, and bridges posed few moral misgivings because they were directed against enemy material, but in other attacks where there may have been enemy deaths, denial was a viable strategy. During Rolling Thunder, denial of enemy deaths started at the top. A month and a half after Xom Bang, President Johnson asserted that American bombing raids "have been directed at concrete and steel, and not human life."[64] From a fighter cockpit, scant evidence of deaths allowed crews to avoid reconciling with the possibility that they were killing men or women. Since several aircraft were normally involved in each attack, a pilot could subconsciously ascribe enemy deaths or civilian casualties to others in the flight.[65] The presence of doubt—similar to the members of a firing squad using one blank round—gave aircrews an opportunity to dodge ultimate responsibility within a collective act of killing and to avoid psychological guilt if they wished. Without tangible evidence, there was the opportunity for denial and avoidance of the issue. Basel eased his uneasy conscience with the possibility that the MiG pilot he shot down had bailed out and survived before his burning aircraft hit the ground. When Basel flashed by, the MiG's "tail section was the only part that was burning; he had probably made it okay, [therefore the pilot's] chances were

---

[63] Despite their personal doubts, both colonels continued to lead missions over Route Pack Six until they were shot down in late 1967. Flynn, interview, 136.

[64]Lyndon B. Johnson, ""Tragedy, Disappointment, and Progress" in Viet-Nam," in *Public Papers of the Presidents of the United States: Lyndon B Johnson 1965* (United States Government Printing Office, 1965).

[65] Lt Col Paul Berg cites Capt Ankerman, an 8th TFW intelligence officer who observed that formation attacks precluded identification of which individual was responsible for destruction of the target. The reverse is also true regarding deaths. Berg, "Assessing the United States Air Force Bombing Effectiveness During Rolling Thunder," 61.

good."[66] This psychological distance from killing lowered moral and psychological obstacles to action.

In the case of attacks on air defenses, there was no need for remorse among many aviators because it energized a "kill or be killed" paradigm. F-4 pilot and POW Sam Johnson accepted the killing in war after the bitter loss of a comrade killed in his life raft by North Koreans during the Korean War. "I grew up in the skies over Korea, until then I had been like a kid playing in the air with big expensive toys. The Air Force had taught me to fly, but Korea taught me to kill." Despite his all his preparations, lectures, books and discussions with veteran aces, "I had to see it for myself and then I understood war means killing. At that point a change came over me. I no longer shot at machines; I shot at men. I knew it was their lives or mine."[67] Other airmen personalized their encounters with the North Vietnamese gunners paying them respect; especially when recalling duels with antiaircraft guns. These attacks became personalized because they sometimes resulted in both adversaries firing directly at each other until one or the other was killed. Accounts of duels between gun crews and air crews recall few instances where either abandoned the fight. Several ended in mutual destruction. The tendency for North Vietnamese gunners to stay at their posts amidst attack led Ken Bell to afford some grudging respect to the enemy gunners, labeling them "tenacious" and "gritty little bastards"[68]

Any aviator who had been in theater more than a few weeks had lost a friend or an acquaintance so there was also an avenging aspect to killing men and women manning Vietnamese antiaircraft systems. F-4 pilot Ed Cobleigh reflected on a successful attack on a Viet-

---

[66] Basel, *Pak Six*, 88.

[67] Sam Johnson, *Captive Warriors: A Vietnam POW's Story* (College Station: Texas A & M University Press, 1992), 77.

[68] Bell, *100 Missions North*, 87, 125.

manned antiaircraft gun battery in Laos: "Do I feel guilty about the dozens of human beings I have dispatched today to Buddhist hell? Not in the least. Those dead guys would have happily killed the Nail [forward air controller], all my buddies, and me. Then they would have awarded themselves medals … and celebrated afterward."[69] Emotion, then had a double effect: physical and emotional distance from the North Vietnamese enabled bombing, while emotional ties to one's friends killed or captured demanded its use.

Crews could also rationalize people killed during attacks within heavily defended airspace due to the magnitude of the dangers they encountered. Under intense fire and low on fuel, Ken Bell missed his leader's attack. "When I spotted him, his bombs were gone and he was pulling away from me. In desperation, I lined up on a road and pickled my bombs hoping to do *some* damage. I was disgusted, but could have sworn my airplane said thank you."[70] Similarly, crews under attack by MiGs frequently jettisoned their bombs hoping that they might do some random, useful damage.[71] The implied logic suggests this rationalization: they were shooting at me so they had it coming, and any inaccuracy is their fault because I did my best. In this case "they" is an extended "they," applied to any bystander in the defended airspace. A greatly

---

[69] Cobleigh, *War For the Hell of It*, 206.

[70] Bell, *100 Missions North*, 117.

[71] An Air Force history of Rolling Thunder (initially classified Top Secret) assessed that some of the bombs that stirred controversy in Harrison Salisbury's December 1967 reports missed due to defenses and poor visibility: "five flights had placed ordnance on target. However, one flight stated they were unable to acquire the target due to clouds and MIG attack. They were uncertain of exact release coordinates, but judged they were in the immediate target vicinity. They conceded that bomb trail distance might have caused ordnance to impact slightly southwest of the bridge located immediately south of the target." Wesley R. Melyan and Lee Bonetti, *Rolling Thunder July 1965 - December 1966*, CHECO Contemporary Historical Evaluation of Combat Operations, July 15, 1967, 99, Air Force Historical Research Agency, Maxwell AFB, AL.

expanded "they" could be applied to the entire country, especially when thought of in the racial terms already discussed.[72]

Attacks in more lightly defended airspace could be more morally troubling because of the reduced element of personal danger. As already noted by Ed Cobleigh, a one-sided fight might seem less fair or honorable to an airman than an attack on a heavily defended one. "In moments of weakness, I feel some pity…that fight is so one-sided."[73] Rationalization could play a role in one's mental self-defense. As already noted, language could create psychological distance, and this distance could serve as a rationalization to live with one's actions after the battle. Reframing one's image of the enemy, or re-naming the enemy was one technique. Rolling Thunder veteran John Jones commented after a later tour in South Vietnam: "when you go out to, to look at a *target*, you have to—you have to, you have to set yourself up, I guess, mentally to think of things as *targets*, you know, and not the fact that—not the fact that there are people there sometimes."[74] Cobleigh also noted the utility in re-framing one's adversary: "pinning a demeaning label across the enemy's face facilitates remorseless killing. The image I have in my head of the 'bad guys' allows me to sleep soundly at night."[75]

Other flyers transferred their responsibility to higher headquarters. This transfer followed the chain of command, from the individual through intermediate commanders to the Secretary of Defense and President, ultimately to the electorate through the Constitution. This transfer however had two mandates: first, the use of violence had to be tightly constrained within orders

---

[72] Baughn's comment that "you have go to kill more than an average amount, more than you do Caucasians to get their attention" is an example (cited earlier).

[73] Cobleigh, *War For the Hell of It*, 206.

[74] Author's italics. John C. Jones, interview by Sandra Mit-Chelle, May 28, 2005, 5, Veterans History Project. Library of Congress.

[75] Cobleigh, *War For the Hell of It*, 112.

and the rules of engagement established by headquarters; second one had to put faith in the leadership up the chain. Although Ronald Bliss (as already noted) admitted to "breaking a lot of rules" in pilot training, when it came to dispensing violence he recalled opting for constraint. He recalled instances where he could not identify his primary target or decided to forgo an attack contemplated against a lucrative backup. "We went over the hillside and just shot [our rockets] into the hills so we wouldn't hit the village. The same thing with a load of thousand-pound bombs" we "just dropped them off somewhere." Although he could have attacked a cluster of forty sampans, he was unsure of their legitimacy and "pulled on up and went and shot [his rockets] on an empty road someplace and came home. We're not a whole bunch of hired killers for no reason. There's got to be a reason."[76]

The transfer of responsibility also mandated trust in one's superiors. F-105F electronic warfare officer Jay Jensen saw bombing and killing a necessary evil, but considered himself a professional who followed orders. In his view, the lives of others depended on him following orders to the best of his ability, but policymakers were ultimately responsible for the orders. Violence outside orders was a "very serious personal crime or sin" but if a warrior objected to the war or how it was carried out, he should remove himself from a position responsible for carrying it out. "Without strict discipline, respect for authority, and trust and confidence in its leaders, no war is ever won nor cause is ever defeated."[77] Jensen's trust, however seemed to be the exception. Aircrews, especially pilots generally sought to maximize their own control and freedom to make what they saw as the best contribution to the war (as *they* thought it should be waged—as indicated by Rasimus' flight leader when he opted to drop only one of his five bombs under

---

[76] Bliss, interview, 23, 42-43.

[77] Jensen, *Six Years in Hell*, 26-27.

Skyspot's direction and left the remaining bombs for his own discretion) and to also balance the dangers (as they saw them) with chances of success. When the execution of the graduated response strategy and the attached political restrictions diminished the effects of aerial attacks and led to the perception of unnecessary losses, it shook aircrews' faith in their leaders.

In Rolling Thunder, authority had everything to say on what was hit and what was not. From the crew's point of view, political "rationality" was often anything but rational. The political requirement as perceived by policymakers in Washington imposed limits on the play of emotion towards escalation, but it also imposed limits on military judgment and experience, creating a crisis in command. The limits on attacks against North Vietnam's air defenses were especially difficult to accept. Although North Vietnamese air defense targets were highly favored, the men who flew in Rolling Thunder had little say in the types of targets they engaged. Many target sets, especially those in the vicinity of Hanoi, were tightly controlled from Washington. The Secretary of Defense and President put major systems like Vietnamese SAM sites or MiG airfields off limits and aircrews railed against the restriction rightly sensing they had to fight from a position of disadvantage. In spite of military preferences, President Johnson reportedly boasted "they can't even bomb an outhouse without my approval."[78]

Authority: "You Are Not Here to Win the War"

Headquarters in Washington, Honolulu, and Saigon selected targets during Rolling Thunder designed to apply what they believed to be carefully calibrated political pressure on the regime in Hanoi. Many targets were more politically symbolic than militarily significant, which was frustrating to the aviators, because higher ups were sending them into the heart of Hanoi's

---

[78] Westmoreland, *A Soldier Reports*, 119.

well-defended airspace to make military pinpricks against caches of oil barrels when large military or industrial targets nearby were kept off limits. Ernest Bedke flew F-4s from Danang in 1966-1967 and felt "frustrated and concerned" with American strategy. "I saw a tremendous amount of capability and military power there being frittered away on almost insignificant tasks in our attempt to bring the enemy to the bargaining table or to get him to stop his infiltration, and, in effect, most of those attempts were almost totally ineffective. We were just not going to the heart of the matter; we were not putting a strong arm on the enemy."[79] Washington placed large sections of North Vietnamese airspace off limits to Air Force fighters which channeled their flight paths into predictable, heavily defended corridors. To Rolling Thunder's fighter pilots, Washington seemed unwilling to win, exercised an oppressive degree of tight control, and limited their basic freedom to maneuver, which ran counter to many of their core aviator values. The fighter pilot drive to compete and win meant that they saw their mission differently. Prohibited areas and buffer zones restrained their inherent freedom of flight, which surrendered many advantages. The emotional pain of losing many close comrades was aggravated in a war Washington seemed unwilling to fight. Suffering heavy losses at the hands of enemy defenses made more dangerous by their own headquarters, a crisis of command simmered beneath the surface among a group of high-spirited but independent thinkers who were raised to exercise their own agency, control, and freedom.

The chain of command relayed orders to bomb specific targets from Washington to the wings in Thailand. President Johnson, working with Secretary of State Dean Rusk and Secretary

---

[79] Bedke's frustration with the war led him to volunteer for a second tour in 1968, in a hope to better understand the war. "I was frustrated and concerned, and I felt somewhat inadequate and ignorant about not being able to understand what it was we were doing in Southeast Asia, so I volunteered to go back, to the consternation of a lot of people, including my family and a lot of friends and people who had thought that I was going to come help them hold down a desk somewhere." Maj Gen Ernest A. Bedke, interview by Lt Col Douglas G. Lamb, January 25, 1988, 19, Air Force Historical Research Agency, Maxwell AFB, AL.

of Defense Robert McNamara picked targets in North Vietnam designed to pressure and signal American intent to the regime in Hanoi. Senior military leaders pleaded for influence over the process, but did not gain military representation until October 1967, when the Chairman of the Joint Chiefs was invited to join the discussion.[80] The Joint Chiefs of Staff (JCS) relayed target lists to field commanders in Hawaii and Saigon, who in turn passed them to subordinate units. The Air Force headquarters in Saigon (initially named Second Air Division, then elevated to Seventh Air Force in March 1966) assigned targets to the wings in Thailand and South Vietnam. Seventh Air Force picked the date and time for each attack, ordnance, and the numbers of aircraft for each strike. Seventh Air Force also allocated supporting assets for each strike include jamming aircraft, air refueling tankers, SAM suppression, air-to-air escort, reconnaissance, and rescue forces.[81] Because they were often close to the heavily defended Hanoi-Haiphong axis, JCS targets commanded considerable resources and attention, mandating large strike and supporting forces of fifty or more aircraft. Seventh Air Force relayed these detailed instructions via secure teletype to the wings as written orders each evening for the next day's mission.[82]

Each evening, wing staffs extracted the relevant data from its fragment (or "frag") of the entire day's tasking order and passed requirements for planes and pilots to the squadrons, and picked their best pilots to lead the toughest missions. The wings assigned a force commander responsible for overall command and coordination of any large wing missions requiring more

---

[80] Clodfelter, *The Limits of Air Power*, 84-88.

[81] Limited numbers of support aircraft mandated central management by Seventh Air Force and were often the limiting factor in the timing and tempo of strikes against North Vietnam. The resources to needed to carry out a single attack came from several bases. Their timing and orchestration were centrally managed through the daily orders issued from Saigon.

[82] Gen William Momyer was commander of Seventh Air Force from July 1966 to August 1968 and details the command structures, fragmentary order procedures, and Rolling Thunder missions in his professional reflections. William W. Momyer, *Airpower in Three Wars*, ed. Lt Col A. J. C. Lavalle (Washington DC: Department of the Air Force, 1978), 82-109, 262, 317.

than four aircraft. Force commanders were the most experienced and capable pilots in the wing, picked for their superior judgment and ability to anticipate and deal with contingencies. Leadership in the air was merit-based. Ability meant more than rank when it came to leading a mission, which meshed well with the pilots' drive to excel, compete, and gain the respect of their peers. The meritocracy in the air motivated pilots to do their best to qualify to lead. Squadrons then assigned pilots to each mission, usually in flights of four aircraft and pilots. Experienced pilots designated as flight leaders commanded four-ship flights, divided into two elements of two aircraft. The least experienced pilots flew as wingmen, following closely their element leaders. All assigned crews were responsible for carrying out their orders conveyed via the daily frag. They were also responsible for complying with a larger set of orders embodied in the rules of engagement detailing what they must not do.[83]

The rules of engagement (ROE, pronounced separately as "R.O.E.") contained sets of instructions for each country detailing under what conditions the use of force was permissible. The rules of engagement reflected political constraints deemed necessary by policy makers to limit the war. Each headquarters from the JCS on down could issue additional limitations on the use of force resulting in an ever-expanding hodgepodge of rules. Over time, the rules of engagement expanded and as problems arose, commanders devised additional rules in an attempt to prevent future mistakes. In 1966, an F-105 pilot noted the current rules already filled a four-inch binder.[84] One F-105 squadron commander observed that in 1965, squadron commanders had some latitude and flexibility but the rules of engagement steadily chipped away at that flexibility

---

[83] Bell, *100 Missions North*, 53-56.

[84] Rasimus, *When Thunder Rolled*, 52.

to the extent that the rules "made me sick to my stomach."[85] The loss of freedom and control grated against the Air Force fliers' belief in winning and autonomy.

The rules for North Vietnam placed substantial geographical limitations on air operations, and the distinctions between those geographical limitations helped define the Rolling Thunder experience for many airmen. On December 10, 1965, Admiral U.S. Grant Sharp, Commander in Chief of U.S. Pacific Command, divided Vietnam into six numbered sectors or "route packs" to preserve the independence of naval air. The route pack structure limited an aviator's freedom to maneuver throughout North Vietnam to preserve service interests as Sharp assigned Route Packs Two, Four, and Five to the Air Force and Route Packs One and Three to the Navy and divided Route Pack Six in half so that the services could schedule their operations separately.[86] Importantly, these airspace divisions became permanent, and the differing route packs delineated different combat experiences for American airmen. Route Pack Six encompassed the highly-defended Red River basin around Hanoi and Haiphong, and missions there became the ultimate test of courage and pulses elevated at the mention of a mission there. In contrast, missions to Route Pack One and Two (which encompassed the relatively lightly-defended southern panhandle) represented a reprieve from danger, although the United States lost many aircraft there as well. Describing the character of the different route packages, G.I. Basel wrote "Pak One was our training ground. The new pilots flew missions there before graduating to Pak Six. Ten missions in easy Pak One was the standard criteria, the visa to Hanoi." On the other hand, "Pak

---

[85] Baughn, interview, 129.

[86] Van Staaveren, *Gradual Failure*, 209.

Six In the east, [was] the place of lost dreams, the grave-yard of hundreds of Thuds, the domain of Hanoi."[87]

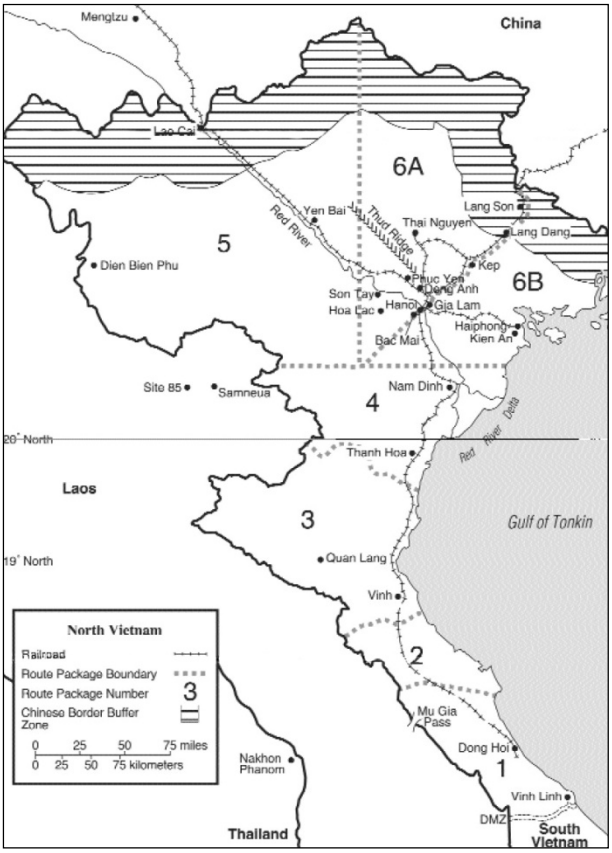


Figure 1: Route Packages: North Vietnam[88]

Different rules of engagement governed aircrews operating in each route package. On April 1, 1966 Washington relinquished control over the southernmost sector, Route Pack One, to

[87] Basel, *Pak Six*, 11.

[88] Van Staaveren, *Gradual Failure*, 240.

Gen Westmoreland in Saigon as part of his "extended battlefield."[89] This shifted the weight of effort in Route Pack One to the Air Force, which fragged numerous relatively unconstrained "armed reconnaissance" missions to hunt for targets there. Because it now featured fewer restrictions (and light defenses), Route Pack One became a favored alternative target area when weather precluded attacks further north. Route Pack One also attracted the attention of crews with extra ordnance remaining after striking their assigned ("fragged") target because they could seek out the enemy with few restraints. Route Packs Two through Five were subject to greater restrictions as distances to the North Vietnamese capital and China decreased. Route Pack Six was the most tightly constrained, where only JCS approved targets were eligible for attack.[90]

Restrictions placed on bombing North Vietnamese air defenses were most keenly felt and resented by crews in Rolling Thunder, who chafed against the lack of freedom to strike back at those locations and systems that threatened them the most. Although American reconnaissance detected their construction in 1965, Washington barred attacks on surface-to-air missile sites. Gen Westmoreland requested permission to strike the sites under construction but wrote that his request was "ridiculed" by Assistant Secretary of Defense for International Security Affairs John McNaughton: "You don't think the North Vietnamese are going to use them!...Putting them in is just a political ploy by the Russians to appease Hanoi."91 After American planes were lost to North Vietnamese SAMs in July 1965, Washington permitted attacks on SAM sites, if the sites were actively in use. These restrictions placed crews at risk because they precluded aerial attacks

---

[89] "At the same time, Sharp decided to make other changes to Rolling Thunder operations. He reassigned the route packages, giving 5 and 6A to the Air Force and 2, 3, 4, and 6B to the Navy." Ibid., 246-7.

[90] Gen Momyer describes the Route Packages and their impact on operations in Airpower in *Three Wars*. F-105 pilot Lt Ed Rasimus recalls the ROE restrictions in *When Thunder Rolled*. Momyer, *Airpower in Three Wars*, 90-99; Rasimus, *When Thunder Rolled*, 60..

[91] Westmoreland, *A Soldier Reports*, 120.

while the sites were most vulnerable, and allowed attacks only when they were operational and the most lethal. Likewise, Washington policy makers kept North Vietnam's MiG bases in Route Pack Six off limits for the first two years of the campaign. Military commanders in Washington, Hawaii, and Saigon repeatedly requested permission to knock out Hanoi's MiG bases but Secretary of Defense McNamara doggedly refused their requests despite mounting losses to Vietnamese MiGs. This put American crews in the precarious and frustrating position of flying within sight of MiG bases en route to their targets but not being able to attack MiG fighters taxiing to the runway preparing to takeoff. Phuc Yen, a MiG base protecting the western approaches to Hanoi was only four miles, and easily visible from the southeastern tip of Thud Ridge, a prominent ridgeline used to cover approaches into Route Pack Six. While leading a strike against downtown Hanoi, Maj James Kasler recalled passing the end of Thud Ridge and "I glanced to the right toward Phuc Yen airfield and could see the flak guns blinking at us."[92] He also observed a MiG on the end of the runway awaiting takeoff. Although MiGs were very vulnerable on the ground, they were off limits until they got airborne. Washington finally approved strikes on Kep and Hoa Lac in April 1967, and Phuc Yen in October 1967, but never approved any strikes on Hanoi's Gia Lam.[93]

Headquarters layered additional geographic limitations on top of these target restrictions further limiting aircrews flexibility in the northern Route Packs and the freedom to maneuver and attack from any direction. Prohibited zones varying between ten and thirty miles surrounded Hanoi and Haiphong, limiting flights into the vicinity of North Vietnam's capital and key port. The rules varied with Washington's attitude towards Hanoi; restrictions lessened as the

---

[92] Kasler, "The Hanoi POL Strike," 4.

[93] Momyer, *Airpower in Three Wars*, 140.

administration increased coercive pressure. The restrictions also prohibited flights from entering a thirty mile buffer zone established along the Chinese border. Policy makers intended the buffer zone to prevent inadvertent flights into Chinese airspace, but it put American crews at risk by limiting routes to and from their targets. At its closest point, Hanoi is only eighty-four miles from China; with both buffers at their thirty mile peak, Rolling Thunder crews were, at times, restricted to a narrow twenty-four mile corridor where North Vietnam was able to mass antiaircraft defenses.[94] While serving as an F-105 squadron commander, Richard Baughn described the problem to his pilots this way: "you are like a barn swallow in a small room. There are only so many places you can hide. They know where you are going to be all the time. They can see you practically all of the time." Voicing his frustration with a situation his own headquarters created, Baughn continued "All they have got to do is concentrate their weapons, and they are going to have you. They can outgun you anytime. It's like having a pissing contest with a skunk, you are going to lose."[95] To Rolling Thunder's crews, the restrictions chafed against their preferences for freedom and local control, but they contributed to losses of friends and colleagues, which might have been avoided with greater tactical flexibility and autonomy.

Washington's gradual escalation further conflicted with American airmen's competitive ethos and desire to win. From early 1965, policy makers in Washington gradually increased the intensity of bombing and its proximity to the capital city, Hanoi. Bombs reached Hanoi in June

---

[94] Remarkably, the administration openly admitted to airspace restrictions during the war. Public admissions may have provided political reassurance that the war was limited and under control, but at the same time these admissions provided militarily valuable information to the adversary. Although North Vietnam's Air Defense Command could be expected to observe and adapt to the routes in and out of North Vietnam, Secretary of State Rusk openly admitted to the Chinese buffer zone in 1966. The Hanoi and Haiphong restricted areas were mapped and published by the New York Times in 1967 putting crews at even greater risk. Neil Sheehan, "Foe Is Said to Use Haven near China," *New York Times*, March 8, 1967; "Rusk Says Planes Avoid China Border," *New York Times*, August 4, 1966; Hanson W. Baldwin, "Targets in the North," *New York Times*, September 21, 1967.

[95] Baughn, interview, 74-75.

1966 with the dramatic raid Jim Kasler led past Phuc Yen against a fuel storage facility. Underscoring the pilot's desire to win, Kasler was enthusiastic to go "downtown" Hanoi despite the acute danger, having dreamt of the opportunity to lead such an important mission.[96] Washington intended gradual escalation to send controlled signals to avoid Chinese intervention by avoiding a more comprehensive effort, but gradual escalation created three problems for aircrews that ran counter to their ethos as aviators. First, the crews were eager to fight to win and get the war over; at the wings this meant pursuing unrestrained attacks against militarily significant targets. Airmen viewed Washington's close control and limited release of targets as pointless procrastination. Instances where strike flights had to fly past large lucrative targets in order to attack small dispersed sites *suspected* of holding military stores were particularly galling to the aircrews understanding of war and how they thought it should be waged.[97] A lieutenant flying F-105s from Takhli noted that attacks on targets of low consequence risked pilots and planes to create bomb craters on a road that would take a half hour to re-grade. Yet these targets might be very close to prominent targets like Thai Nguyen steel works that the crews saw as significant. "There was this big smokestack, a huge thing; it was one of your landmarks, you know, but you weren't allowed to touch it. You kind of felt like there were targets there that you should be hitting, and you weren't."[98]

Second, airmen believed the policy of gradual pressure telegraphed the next American move in the war allowing the North Vietnamese to blunt the effect of American air strikes. The slow widening of the war allowed the Army to disperse, harden, and hide resources lessening the

---

[96] Van Staaveren, *Gradual Failure*, 279-307; Kasler, "The Hanoi POL Strike."

[97] Ronald Bliss found it ironic on one mission that eight F-105s were put at risk near Hanoi's heavy defenses to attack "two bomb craters with about fifteen 55-gallon drums in them!" Bliss, interview, 39.

[98] Col Martin J. Neuens, interview by Dr. James C. Hasdorff, September 26, 1991, 20, Air Force Historical Research Agency, Maxwell AFB, AL.

impact of subsequent air attacks. In response to the 1966 attacks against oil, the Vietnamese dispersed their oil and gasoline supply into hundreds, if not thousands of small clusters of oil drums.[99] Dispersal reduced the vulnerability of major petroleum, oil, and lubricant (POL) facilities (with lowered fuel levels), making them less critical, and making the entire system less vulnerable (although dispersal came at a cost in efficiency). In the words of Lt Col Martin Neuens, gradual escalation "gave them all the advantages," which was anathema to a highly competitive fighter pilot bred with a determination to win. "It's just not a way to run a war."[100] Although American pilots appreciated a challenge, they expected their headquarters to fight as hard as they were. With their lives on the line, crews wanted Seventh Air Force to do all they could to help them win by sending them against worthwhile targets, imposing minimal constraints, and knocking out North Vietnam's air defenses, not forcing them to be barn swallows in small rooms as analogized by Richard Baughn.

Third, gradual escalation made only pinpricks against North Vietnam's air defenses and allowed the Air Defense Command to prepare and strengthen its air defense network making American missions even more costly. The traditional American "way of war," according to some historians, strives for the annihilation of the opposing enemy force through material and technical superiority, after which American forces exploit the situation.[101] This strategic culture was reinforced for American airmen during the costly battle for air superiority over northern Europe 1942-1945 when the German Luftwaffe decimated unescorted American bombers. Bombers were only able to return to the skies when long-range fighter escorts became available to defeat the

---

[99] Van Staaveren, *Gradual Failure*, 285.

[100] Neuens, interview, 21.

[101] Russell Frank Weigley, *The American Way of War; A History of United States Military Strategy and Policy* (New York: Macmillan, 1973).

Luftwaffe in 1944.[102] The newly-independent USAF rapidly established air superiority over the Korean peninsula in 1950 by bombing Korean airfields and shooting down Communist fighters, driving the North Korean air forces off the peninsula and later holding the Red Chinese to a sanctuary across the border in China. Air Force F-86 Sabre pilots were then able to achieve a ten-to-one kill advantage over Chinese MiGs in legendary dogfights in "MiG Alley" south of the Yalu River dividing North Korea from China.[103] None of this was likely to have been lost on the Air Force's leadership in Southeast Asia, since they waged those campaigns as junior officers.

The USAF generals and colonels who led wings and ran the Seventh Air Force in Saigon during Rolling Thunder were largely veterans of both these conflicts, while most of the USAF's majors and lieutenant colonels who led squadrons in Rolling Thunder were veterans of the Korean War. It was clear to airmen that they needed to annihilate the growing North Vietnamese air defense system through a vigorous campaign to win air superiority through attacks on MiG bases, SAM sites, and their supporting infrastructure followed by a shift to attacks against North Vietnam's other sectors, especially military targets and supplies in and around the restricted zones, which the PAVN used as secure sanctuaries.[104]

The frustrations of the rules of engagement and graduated response created substantial problems within the fighter crews flying Rolling Thunder missions. One reaction was to vent

---

[102] For an excellent work on the battle for air superiority over Germany, see Stephen L. McFarland and Wesley P. Newton, *To Command the Sky: The Battle for Air Superiority Over Germany, 1942-1944* (Washington DC: Smithsonian Institution Press, 1991).

[103] Robert Frank Futrell, *The United States Air Force in Korea, 1950-1953*, Rev. ed. (Washington DC: Office of Air Force History, United States Air Force, 1983), 98-103, 285-312, 401-432, 694-699.

[104] In March 1966, military commanders identified an opportunity to destroy fifty-three crates containing up to thirty new MiGs awaiting assembly at Phuc Yen Airfield twenty miles northwest of Hanoi. The attack request was denied by civilian policy makers, as had almost a dozen earlier requests. This ongoing limitation, a year into the campaign would ensure that these MiGs would have to be encountered in a more deadly forum in the air sometime in the future. Van Staaveren, *Gradual Failure*, 241.

frustrations in social settings. Aircrews were unified in attitude against the directives from above. F-105 squadron commander Robert Smith recounted "YGBSM was our expletive, 'You've Gotta Be Shitting Me!' reserved to be uttered only when the demands from Headquarters were unbelievable." Frustrated, Smith further added: "it seemed that most everything that came down from Washington through Seventh Air Force headquarters demanded its use!"[105] The officer's club bar was a frequent site for the release of emotions. The breaking of glasses and furniture was a commonplace occurrence, and the pilots placated officer's club managers through a tacit understanding that the pilots would pay for the damages the next morning. Bar songs were a form of collective protest that acknowledged the plight of aircrews, and reinforced the common bonds of fellowship used to weather adversity. One song written and sung at Takhli in 1965 was titled "Our Leaders" and gave voice to the fighter crews' distrust of their senior officers, a disdain for regimented bomber tactics, and resentment towards the Secretary of Defense McNamara ("Mac") and President Johnson's ("LBJ") micromanagement of the campaign. Although the Seventh Air Force commander, William Momyer was a fighter pilot, the Air Force's general officer ranks were dominated by former bomber pilots. Fighter crews believed these bomber generals were anchored in the past and their tactical ideas were out of touch with the realities of combat over North Vietnam.[106]

> *They send us out in bunches to bomb a bridge and die.*
> *These tactics are for bombers which our leaders used to fly.*
> *The bastards don't trust our colonel up in Wing.*
> *I guess we'll have to leave the thinking to the gears in JCS.*

---

[105] Smith, "Robert W. Smith Autobiography."

[106] When asked for an assessment of their leadership, a group of F-105 pilots completing their combat tours refused to comment, stating they had a song about them—presumably "Our Leaders" (but declined to sing it for the interview). See Bob Wilson et al., Audio Tape #4 of 16, May 1965, Historical Research Agency.

Refrain: Our leaders, our leaders, our leaders is what they always say,
But it's bullshit, it's bullshit, it's bullshit they feed us every day.

The JCS are generals but they're not always right.
Sometimes they have to think it over well into the night.
When they have a question or something they can't hack,
They have to leave the judgment to that mother-fucking Mac.

Refrain.

Now Mac's job is in danger for he's on salary too.
To have the final say-so is something he can't do.
Before we fly a mission and everything's ok.
Mac has to get permission from flight leader LBJ.

Refrain.[107]

The exercise of one's own local control and freedom in violation of the rules was a more significant resistance to restraint and authority. One approach entailed violating the rules of engagement in order to reduce risk. The buffer zone along the Chinese border, for example offered an appealing route of approach. F-4 pilot Kevin McManus believed he could disregard the rules of engagement if they mandated "stupid" actions. "It just so happened that 0 to 20 miles from the Chinese border [were] gorgeous valleys…[that] afforded you an awful lot of protection." Because the valleys were in the buffer zone, "they were very lightly, almost nonexistently defended, so you could fly through those valleys with a four-ship and get very, very close to your target without ever being seen." Like a UPT student on a solo ride, McManus knew the rules, but pushed beyond their boundaries to exercise his own control and capitalize on the freedom of flight to maneuver through safer areas. "We tried to follow the rules of engagement as much as possible, but sometimes we deliberately didn't." McManus noted that his peers were comfortable disregarding some rules, but that they would have to comply when operating with another wing

[107] Laurence to Lydia Fish, "The Thud."

due to the surveillance of others.[108] Richard Hamilton (who had tried some solo aerobatics in pilot training and then red-faced, lied to his instructor about it), and his peers only selectively applied the rules of engagement. "Most of us decided the way we were going to stay alive was to just kind of keep it to yourself, don't say too much and just do what you need to do." Like McManus, Hamilton ignored the rules that he disagreed with, but kept it quiet. "Any time they'd say 'I want you to bomb on this heading' we'd go in and say, 'that's a dumb heading because it puts us right here, let's bomb out of the sun' and we'd just change it around and never tell anybody."[109]

As noted, a commonplace reaction was to jettison ordnance when threatened by SAMs or MiGs. Jettisons were permitted to defend against MiGs, but unauthorized within Pack Six if the target proved unsuitable; yet they remained a routine occurrence.[110] The jettison of weapons and fuel tanks reduced aerodynamic drag and weight making an aircraft faster and more maneuverable, and therefore better able to defend itself from MiGs or SAMs. Jettisons were sometimes accomplished while under attack without regard to location; the rules of engagement seemed to have little pull when one's very survival was on the line. There were other instances when pilots missed an attack and jettisoned ordnance to keep up with the rest of the flight. Under pressure, they often picked something that looked of value to bomb and wring some value out of the mission. As already noted, Ken Bell recalled coming under attack in Route Pack Six, low on fuel, and he missed following his leader's attack: "In desperation, I lined up on a road and pickled my bombs hoping to do *some* damage." In still others, strike crews might adjust their aim from the primary target to a nearby air defense site. This action could give some license and legitimacy

---

[108] Lt Col Kevin J. McManus, interview by Dr. James C. Hasdorff, September 18, 1991, 19, Air Force Historical Research Agency, Maxwell AFB, AL.

[109] Hamilton, interview, 45-46.

[110] Al Lenski, *Magic 100: The Story of an F-105, 100 Combat Mission Tour, NVN '67* (Paducah, KY: Turner Pub, 1995), 23.

to acting on the desire to knock out air defense targets. Although Thud pilot Ronald Bliss shot his rockets into a hillside instead of hitting a civilian village or sampans, he felt no such restraint towards a SAM battery. His flight came under heavy attack by SAMs, which caused his flight leader to lose their target: "I heard this big roar. This big, black object [a SAM] came in front of me and behind Bowman and blew up right over here." Bliss' leader called out eight different SAM launches to his flight but then called out "I can't find the damn target." Bliss replied "Who cares? It doesn't matter if you hit that target at all." I said, and the flight turned to attack a nearby SAM site.[111]

The purpose behind a great deal of ROE violations indicate a high degree of devotion to the mission (in the crews' eyes), but from a legal perspective violating the rules of engagement carried the same weight as violating a direct order.[112] Any violations then, started aircrews down a slippery slope that undermined military order and discipline. From the range of violations, the most troublesome reaction was a blatant disregard for the rules of engagement where crews took matters into their own hands and intentionally attacked off limits targets. Ed Rasimus recalled a mission where his flight picked out a prominent oil storage facility near Haiphong as a backup target in lieu of the assigned backup. When the weather precluded an attack on the primary target, the flight attacked the oil tank. When their squadron commander found out about the attack, he detained them for several hours until he could wrest a slender legal justification from the byzantine rules of engagement.[113] Charles Horner, who later became a general and commanded the air operations in Desert Storm, recounted quietly asking his maintenance crew to covertly

---

[111] Bell, *100 Missions North*, 117; Smith, "Robert W. Smith Autobiography," "Limited Weapons Assured Defeat"; Bliss, interview, 40.

[112] Maj Paul E. Jeter, "What Do Special Instructions Bring to the Rules of Engagements? Chaos or Clarity," *The Air Force Law Review* 55 (2004): 410.

[113] Rasimus, *When Thunder Rolled*, 160.

load an extra missile for him to fire at an off limits target in Route Pack Six. He then lied in the intelligence briefing, covering up the location of the attack. His reflection recounts the toxic environment created within the chain of command. "The first casualty of a war that didn't make sense was integrity."[114] By taking control away from headquarters and exercising more freedom and autonomy than authorized, pilots lost the legitimacy behind their attacks, because as already noted, legitimate use of violence had to be constrained within the orders and the rules of engagement passed down the chain of command. Crews who waged war outside proscribed boundaries were on their own.

Attitudes and actions towards authority placed squadron and wing commanders in a difficult situation. As commanders, they had to enforce rules that were diminishing the combat effectiveness of their missions and causing additional deaths or capture of their men. Every level of the chain of command in Southeast Asia felt their frustration over this dilemma. Gen William Momyer, a former fighter pilot and Seventh Air Force Commander in Saigon, lamented the political restraints on attacking the North's defenses, which subjected his airmen to unnecessary dangers: "it is an ugly and bitter thing to hold a hand voluntarily behind one's back while being beaten or watching one's friend being beaten."[115] At the wing and squadron levels, the frustration was even more palpable because these commanders shared the same dangers as they led missions and lost close friends. Maj Bud Day, the commander of a special F-100F forward air controller unit, likened the situation to "throwing a bound man into the mouth of a tiger."[116]

---

[114] James Kitfield, *Prodigal Soldiers: How the Generation of Officers Born of Vietnam Revolutionized the American Style of War* (New York: Simon & Schuster, 1995), 84.

[115] Momyer, *Airpower in Three Wars*, 378.

[116] Day, *Return with Honor*, 45.

Air Force commanders were forced to choose between sympathizing with their crews and enforcing many limits on violence they did not believe in. Despite their preferences for local control as fighter pilots, all had a role in enforcing military discipline, limiting escalation of violence in service of national policy, and continued American military subordination to civilian control. Two pilots from the 355th TFW approached Col Jack Broughton, their vice wing commander, and confessed to strafing a Soviet cargo ship in Haiphong Harbor when it fired on them. Broughton, a leader who never shirked the toughest of missions into Route Pack Six elected to cover for his pilots and destroyed the evidence of their ROE violation by exposing their gun camera films. The commander of the Pacific Air Forces responded with harsh discipline, relieving Broughton immediately and ordering a court martial for all three officers.[117]

In perhaps the most blatant and highest-ranking act of violence outside the limits, Col Heath Bottomly, the Taklhi *wing commander* violated the rules of engagement by taking off alone and deliberately flying solo to North Vietnam, after it had been placed off limits, and attacking an antiaircraft site responsible for the death of his wingman. His wingman had nursed a damaged F-105 to a safe landing in Thailand, but it was engulfed in flame once on the ground. Reeling from the incident, Bottomly returned to his own still-loaded aircraft "in a daze of anger and hatred and shock and revenge" and launched on a personal vendetta against the Vietnamese gunners.[118] As a wing commander, Bottomly was the embodiment of authority within his wing; his blatant violation indicates the powerful potential for violence to escalate and override the

---

[117] The pilots were acquitted, but Broughton was found guilty of destroying government property (the film). He was fined for the cost of the film, but his career was over. Jack Broughton, *Going Downtown: The War Against Hanoi and Washington* (New York: Orion Books, 1988), 207-256; Chuck Yeager, *Yeager, an Autobiography* (Toronto: Bantam Books, 1985), 294-297.

[118] Bottomly's attack took place after the termination of Rolling Thunder and North Vietnamese targets were off limits. He was bombing the Ho Chi Minh Trail as part of Operation Commando Hunt when he came under attack from across the North Vietnamese border. Heath Bottomly, *Prodigal Father: A Fighter Pilot Finds Peace in the Wake of His Destruction* (Glendale, CA: G/L Regal Books, 1975), 99-103.

limits imposed by reason.[119] The passions ignited by the death of his comrade activated Bottomly's desire to act freely. He saw red and the emotions of violence surpassed the voice of restraint and submission to authority. Similarly, a key subordinate believed Broughton's discipline was shattered by the stress of prolonged combat and the emotional trauma of losing two of his three squadron commanders in rapid succession. Emotion shattered the ability of a pair of respected senior officers to uphold military restraint and discipline.[120]

Leaders at the wing and squadron levels tried to solve the conflicting forces dividing them between sympathy for the plight of their pilots and the demands of authority by adopting a risk-limiting strategy. Squadron commander Richard Baughn saw London's devastation in World War II, and accepted killing as part of war: "you can't win wars without killing people." Baughn's interpretation of Washington's restrained way of fighting convinced him that the United States was not out to win. Reflecting on the combination of aggressive pilots, dangerous airspace restrictions, and proscribed air defense targets, Baughn gained an insight on the war and "just like that I changed." He subsequently ordered his pilots to limit their actions and avoid risks. "Guys, you and you and you and the rest of you in this room are not going to win this war on any single mission or any single combat tour. We are going to do exactly what we are told to do, no more, no less. In other words, don't go up there and try to go down and strafe everything you see and try to win it on your own because eventually you are going to get your ass shot down."[121]

---

[119] Immediately suspended from command, Col Bottomly was spared a court martial by a timely and fortunate change to the rules of engagement allowing crews to return fire against positions firing across the border. Ibid., 116.

[120] William Norris recalled "Broughton was very emotionally involved in this. Two of the squadron commanders, that he was very close to, went down within a week's time….He was very emotional; he was tired; he flew a lot. I think he had the feeling that, Goddamnit, nobody is going to hurt my guys." Col William C. Norris, interview by Lt Col Paul C. Weiland and Maj Richard B. Clement, February 1, 1971, 3, Air Force Historical Research Agency, Maxwell AFB, AL.

[121] Baughn, interview, 73-75.

Baughn's order ran counter to core fighter pilot beliefs, those valuing aggressiveness and winning, individual control and freedom, and "a lot of them [his men] didn't like it."[122] Determining the appropriate risk level was a command prerogative, but there was a danger that crews would see their own leaders as further interfering with their idealized notions of how the war should be fought and limiting what agency they still possessed. Wing commander Robin Olds had a similar risk-limiting message and delivered it personally to new crews; at the same time he led the most dangerous missions, accepting considerable risk when warranted. In May 1967, Capt Wayne Smith arrived in theater to conduct a combat test on a new guided bomb as part of Old's F-4 wing. "Shortly after we got there, Robin Olds met us to welcome us to the war, and he said a very curious thing shortly, into the briefing. He said, 'You've got to get one thing out of your mind. You are not here to win the war.' You can see from my upbringing [I am] a sort of a competitive guy and even going through the orientation that you get from the Air Force Academy. You are there to win! You don't do anything unless you are there to win, where there's nothing short of winning that's acceptable. That's not what you want to hear. But Olds said, 'You are here to fly and fight.'"[123] Old's message, with his aptitude for leading the toughest missions, maximized the chances that his crews would comply with his guidance.

Other senior wing leaders who did not lead in battle were unable to exert the same level of influence as those who set personal examples. After the 388th TFW lost its three top colonels in fall 1967, their replacements did not meet the expectations of the wing's pilots. F-105 squadron commander Robert Smith recalled turning away from the new cohort of the wing's senior leaders.

---

[122] Baughn 73-75.

[123] Wayne O. Smith, interview by Dr. James C. Hasdorff, October 2, 1992, 18, Air Force Historical Research Agency, Maxwell AFB, AL.

"From that point on, we took care of ourselves from the squadron level, because the replacements for our leaders that we got saddled with were neither replacements nor leaders!" Smith flew with his wing director of operations, who panicked under trivial and non-threatening fire and subsequently avoided combat. "I could not abide any combat pilot who would not try to share the load, and worse yet one who refused to fight."[124] Ed Schneider commanded the 37th TFW, an F-100 wing in South Vietnam and drew a similar reaction from one of his units. He was responsible for a special unit of aggressive and high-spirited F-100F jet forward air controllers (FACs) who patrolled Route Pack One and flew under the call sign "Misty." He issued risk-limiting guidance to his F-100 Misty pilots that they largely disregarded.[125] Schneider did not fly the dangerous missions into North Vietnam with his Misty pilots, limiting his missions to the relatively safer skies of South Vietnam. The Misty pilots in turn perceived his risk-limiting guidance as a career enhancing step to preserve his wing's safety record. "Schneider seemed to care more about sortie rates, abort rates, maintenance reports, and aircraft losses—and keeping those metrics up to par with other bases" than he did about combat, in the words of one Misty pilot. Because Schneider did not accept the same risks as the Mistys, they did not respect his guidance and his pilots essentially wrote their own rules.[126] If commanders were unwilling or unable to lead and set a personal example as courageous and capable aviators, their crews distrusted their decisions.

---

[124] Smith, "Robert W. Smith Autobiography," 193.

[125] Misty F-100s flew two seat F-100Fs into Route Pack One to identify targets for other fighters operating in the Route Pack. The unit attracted the most aggressive and motivated pilots because they flew high-risk missions into North Vietnam, when the rest of the aging F-100s were limited to lower threat missions in South Vietnam and Laos.

[126] Former Misty pilot and unofficial historian, Maj Gen Don Shepperd co-authored the Misty's narrative history. Rick Newman and Don Shepperd, *Bury Us Upside down: The Misty Pilots and the Secret Battle for the Ho Chi Minh Trail* (New York: Presidio Press/Ballantine Books, 2006), 36-37, 59-60; Smith, "Robert W. Smith Autobiography," 193.

Leaders sought to strike a difficult balance; fight within the mandated boundaries, make intelligent risk decisions, but they also had obligations to cultivate and nurture the warrior ethos that defined their elite aviators. Ronald Bliss, an F-105 pilot described his own personal struggle to find the right balance between violence, restraint, and compliance. Leaving North Vietnam, Bliss and his flight spotted a large freighter unloading in the Chinese buffer zone. "We could have strafed that thing" but "the rules of engagement said that we couldn't do it." Bliss did not attack, but took fire from the ship as he flashed by. "It was like that [with only] split seconds to make decisions like that. You're going to make some good ones, and you're going to make some bad ones. Some days, if you drop your ordnance you're wrong, and some days, if you don't drop it, you're wrong. It's a hard call especially when you're running out of gas."[127]

Rolling Thunder's highly-spirited fighter pilots were motivated by their nature and training to fight to win. Their ability to use the full range of flight's flexibility and freedom, and their own control were constrained by headquarters directives, which they perceived as interference. Politically-driven decisions hindered the crew's version of how war ought to be waged. Close supervision from many levels of headquarters in an effort to closely control violence and prevent escalation reduced flexibility, lessened chances of success, and increased the risks to the crews. Combined, the rules of engagement and the gradual escalation of the strikes on the North were outrageous to the crews. Some crews elected to resist limitations on their own flexibility and control and violated the rules of engagement. Commanders had to find a way to enforce the rules and limit violence to the boundaries prescribed by civilian leadership and try to keep faith with their crews, whom they knew would suffer from those limitations. Some commanders succumbed to the powerful pull of emotion, violence, and downward allegiance over

---

[127] Bliss, interview, 43-44.

military discipline. Others, (exemplified by Olds' message that "you are not here to win the war") negotiated a risk-limiting strategy that sought to protect their crews at the cost of mission effectiveness. Orders from commanders who shared in the full range of dangers over North Vietnam were more likely to enjoy respect due to the open meritocratic leadership based on fair competition enjoyed by fighter pilots in the air. Wing commanders, just like line pilots had the opportunity to earn the respect of their own men based on their flying proficiency. Commanders who could not lead effectively in the air enjoyed less respect and their direction carried less weight than a commander showing proficiency in the air.[128] Despite the limitations imposed from above, fighter crews were eager to win and sought tactics and technology to maximize chances to destroy North Vietnam's capability, and to find opportunities to exercise their own freedom and control to minimize risk to themselves and their peers. The struggle to balance mission, restraint, and subordination to authority took place in an environment of proximate and mortal dangers posed by North Vietnam's air defense. Airmen faced a real fear of death or capture (and subsequent torture) on every mission over North Vietnam. The nature of that risk, and how USAF fighter crews perceived, confronted, and adapted to it are the subject of the next chapter.

[128] The non-flying bomber generals running the Air Force garnered the least respect of many fighter crews as captured by the lyrics of "Our Leaders" already noted.

Chapter 4: Risk and the Fight for Air Superiority

Rolling Thunder featured a continuous, fierce, and indecisive battle for air superiority over North Vietnam throughout its entire three and a half year campaign.[1] Despite American technology and resources, the U.S. Air Force and U.S. Navy were unable to decisively defeat the North Vietnamese air defense forces by shattering their air defense system or breaking the will of their air defense troops. The resulting seesaw and frustrating battle provided a defining context for the individual experience of Air Force aircrews. Unable to mitigate the risks of flight over the North, crews had to face considerable dangers and master their fears every time they went into North Vietnam. This chapter details three threats: antiaircraft guns, surface-to-air missiles, and MiG fighter jets, which threatened American aircrews throughout the campaign, and created a tension between mission accomplishment and the risk of getting shot down. Each subsection details some of the technical and tactical interactions between the adversaries and how that interaction was perceived by the American flyers. Fighter crews sensed and attempted to counter each of these threats differently; North Vietnam's antiaircraft guns defied technical solutions and could only be defeated by avoidance, yet crews were initially reluctant to avoid them because they were unwilling to sacrifice mission effectiveness and were more concerned about increased exposure to North Vietnam's missiles and fighters. Before the war, USAF fighter pilots planned to counter surface-to-air missiles by using their fighter's maneuvering capabilities to dodge

[1] In 2001, the Joint Staff defined air superiority as "that degree of dominance in the air battle of one force over another that permits the conduct of operations by the former and its related land, sea, and air forces at a given time and place without prohibitive interference by the opposing force." *Joint Publication 1-02: Department of Defense Dictionary of Military and Associated Terms*, 2001, 28.

oncoming missiles, but turned to technological solutions that required adjustments to fighter cultural values. To negate North Vietnam's missiles, fighter pilots would have to surrender a degree of their individual control, maneuverability, and freedom for technological fixes that included radar warning receivers, jamming pods, and improved teamwork that locked pilots into rigid bomber-like formations to mass their electronic jamming. While strike pilots surrendered some freedoms, others sent to fight MiGs found great measures of power, control, and freedom in the air-to-air role. American pilots countered MiG fighters by devoting a portion of their most capable fighter aircraft, the F-4 Phantom, to an escort role to protect bomb-laden strike aircraft—a mission most pilots were eager to perform because a victory over a MiG was the path to glory and because that mission granted pilots the greatest degree of control and freedom to fight a skilled adversary in a free-wheeling dogfight. But despite the Air Force's tactical and technological innovations, North Vietnam's air defenses remained a formidable obstacle throughout the campaign and inflicted losses on American fighters from the first day of the campaign to the last.[2]

Flak: "It was Just Horrible"

Antiaircraft fire posed the first, last, and most lethal threat to aircrews in Rolling Thunder. From the first Thud lost in the attack on Xom Bang on March 2, 1965, to the last Thud lost on a night armed reconnaissance mission over Quang Khe on October 27, 1968, the Air Defense Command's guns posed a ubiquitous and lethal danger.[3] During Rolling Thunder, antiaircraft

---

[2] A U.S. Marine Corps F-4J was the last aircraft shot down in Rolling Thunder, downed on the afternoon of November 1, 1968 a few miles north of the DMZ. Hobson, *Vietnam Air Losses*, 166.

[3] Anti-aircraft fire hit an F-105, piloted by 1Lt Robert C. Edmunds during a night interdiction attack in the North Vietnamese panhandle. An Air Force RF-4C was lost sometime later on the night of the 27/28th due to unknown causes. These two aircraft were the last USAF combat losses of Rolling Thunder, which ended November 1, 1968. Ibid.

guns brought down two thirds of the 299 F-105s lost between March 1965 and October 1968. By comparison, surface-to-air missiles claimed 9 percent of F-105 losses, and MiGs accounted for 6 percent, the remaining 18 percent were lost due to operational mishaps or unknown reasons.[4]

The dangers posed by antiaircraft fire varied by altitude. The higher one flew over North Vietnam, the lower the risks from antiaircraft fire. There were few heavy guns (large, expensive artillery pieces of 85 millimeter caliber and above) able to reach above 20,000 feet, and those that could reach that height were fairly easy to evade. A concentration of large 85 millimeter guns in northwest North Vietnam seemed so benign that Robert Smith laughed at a new wingman's reaction to high altitude fire: "We encountered typical defenses and some added 85 mm AAA on the way home, from the place we called the gunnery school, near Dien Bien Phu. We thought nothing of that, and a bit of jinking protected us from their individual sites." When his inexperienced wingman panicked at the sight of nearby flak bursts, Smith was unfazed. "When it was over I was laughing, as we flew safely away, because it was such a humorous sight to see his obviously panicked and unusual gyrations while we made gentle turns. Compared to any attack in Pack VI this was incidental."[5] Smith was confident in his abilities, was familiar with the area, and used his expertise and gentle maneuvering to minimize the high altitude risk.

---

[4] This table compiles F-105s lost during Rolling Thunder (March 2, 1965 to October 31, 1968) indicating the relatively large threats posed by guns, and the lesser threats posed by missiles, and MiG fighters:

F-105 Losses	1965	1966	1967	1968	Total
MiG	1	3	10	4	18
SAM	3	7	15	2	27
AAA	43	80	54	24	201
Mishap/Other	10	15	18	10	53
Total	57	105	97	40	299

Ibid., 15-166.

[5] It is likely this was fire from Yen Bai, although it is some distance from Dien Bien Phu. Other accounts refer to the guns at Yen Bai as "the gunnery school." The panicked wingman was Smith's new boss, the

Below 4,000 feet, every antiaircraft gun, rifle, and machine gun could reach low-flying aircraft, making low altitude flight very dangerous. In peacetime, airmen have regularly underestimated the danger of antiaircraft fire at low altitude, and Vietnam proved no exception.[6] Fighter training in the 1950s and early 1960s featured low altitude nuclear tactics designed to enable low and fast nuclear strikes by single aircraft. The training that accompanied the nuclear mission was thrilling and created habit patterns in peacetime that were slow to change in war. High speed, low altitude solo flights were enjoyable training events that appealed to some of the basic joys of flight, and conveyed a sense of incredible powers well beyond one's corporeal capacities. Jud McLester recalled his nuclear training in the F-100. "You can't imagine how exhilarating it is to fly an aircraft one hundred feet off the ground at four or five hundred knots" McLester described that "at five hundred knots and one hundred feet above the deck the sense of speed and power is almost like an aphrodisiac."[7] Although it was fun training and perhaps necessary for a nuclear exchange, low altitude ingress was not suited for combat in Southeast Asia. Early in Rolling Thunder, fighter pilots flew at low altitude in many fruitless efforts to surprise North Vietnamese defenders, but were often detected and fired on by armed citizens and soldiers throughout the countryside. Thud pilot Ed Rasimus described the magnitude of the antiaircraft threat during a late afternoon attack carried out under darkening skies when muzzle

---

wing's new Director of Operations. Smith subsequently lost confidence in his boss because Smith believed he was unwilling to fly the tough missions. Smith, "Robert W. Smith Autobiography," 192.

[6] In World War II, flak downed more American aircraft than any other source, decimating the heroic and spectacular low altitude bomber raid on the Ploesti oil refinery, and later inflicting the highest losses on American fighters conducting low altitude strafing attacks in Germany and the Low Countries. During the Korean War, Fifth Air Force ordered a minimum floor of 3,000 feet after an analysis in 1952 revealed that half of the Air Force's ground fire hits took place below 2,500 feet. Kenneth P. Werrell, *Archie, Flak, AAA, and SAM: A Short Operational History of Ground-Based Air Defense* (Maxwell Air Force Base, AL: Air University Press, 1988), 57-58, 76-77.

[7] McLester, *Thru a Pilot's Eye*, 138-139.

flashes were apparent. As he began his attack, guns of all calibers "flicker[ed] like the flashbulbs of the Washington D.C. press corps meeting the president's plane at night. Ten miles long by five miles wide was a sea of white flashes"[8]

Pilots used jinking—sharp changes in direction—to spoil aimed antiaircraft fire. Thud pilot Jack Broughton took pride in his aggressive jinks, which he described as "the art of weaving, bobbing, twisting, and turning to avoid enemy gunfire." He drew some razzing from his fellow pilots due to his zeal for jinking, but believed that his actions led to his success in avoiding gunfire. "They used to call me the 'Super Jinker' but I never got hit coming off target."[9] Jinking helped avoid aimed fire, but it was little help in dodging un-aimed barrage fire—a common practice of North Vietnam's gunners who sought to fill the skies over important targets with a dark cloud of bursting flak. In these cases, jinking may have done little more than give crews an illusion of control.

By 1966, fighter crews felt that they had no choice and believed that despite the risk of antiaircraft fire, they needed to fly low through the most heavily defended areas of North Vietnam to avoid the growing threat of surface-to-air missiles. It was not until the third year of the campaign in mid-1967 when technological innovations in electronic warfare provided effective counters to the missiles, and crews gained confidence that they could fly at high and medium altitudes at much reduced risk.

Regardless of whether a strike flew in at high or low altitude, all had to dive into flak in the target area to carry out their attacks—without jinking—in order to achieve a hit. Scores of very lethal rapid-firing thirty-seven and fifty-seven millimeter guns surrounded important targets,

---

[8] Rasimus, *When Thunder Rolled*, 81.

[9] Jack Broughton, *Thud Ridge* (Philadelphia: Lippincott, 1969), 25.

which could fill the sky with bursting shells. Antiaircraft barrages were plainly visible, even in daylight, because of the bright muzzle flashes of the medium caliber guns and the cloud puffs and explosions that appeared in the sky over the target. The best counter was to fly around or over barrages, but when they were over the target, crews had to dive into a maelstrom of steel, smoke, and fire to complete their attacks. Maj Merlyn Dethlefsen dove his F-105 into an intense barrage over Thai Nguyen Iron Works on March 10, 1967 to protect a large strike force from two SAM sites. He recounted that: "oh man that flak was so intense that I lost [sight of my flight lead]. That sky was just black. It was just horrible. You can't imagine." The flak downed his leader and damaged all the other aircraft in the flight, yet Dethlefsen elected to dive four times through the barrage to bomb and strafe two SAM sites in order to protect the strike flight, and ultimately earned the Medal of Honor for this extraordinary action.[10]

The clouds created by flak bursts of medium and heavy antiaircraft guns around a target posed one of the greatest challenges to a pilot's courage and concentration. To dive into and fly through a cloud of flak, particularly on a bombing run requiring five seconds of steady non-maneuvering flight was an act of considerable bravery. The best and most steady pilots, well-conditioned to control their fears since UPT, could push aside the fear through concentration on the attack. F-105 pilot Robert Smith recollected: "I had no trouble concentrating on the job at hand from the moment the mission commander started his roll-in on the bomb run and throughout my attack, the result of working so hard at visualization and concentration in my dive bomb training. Immediately I discovered that nothing reduced the stress of a mission more than deep concentration on a successful diving attack." Once the attack was completed, a pilot regained a degree of control and the freedom to exercise it. "Only after the bombs released was I free to

---

[10] Dethlefsen, interview, 66.

evade defenses and there was no remaining obligation except to find my flight. The ability to maneuver and evade fire increased the feeling of security, from that moment. I had not only noticed but marveled at the flak until it came near my time to roll-in, but became oblivious to it the moment it was my turn to dive into the attack."[11] Because there could be no maneuvering in order to accurately release a bomb, pilots had to make a tradeoff—they focused their concentration on perfecting their bomb run, which surrendered one's agency and skill against the defenses to chance.

The element of chance was a difficult aspect of the air war to accept for men who thrived on control. Their lives and reputations hinged on controlling their aircraft, and they tried to maintain an illusion of control when facing an animate enemy or a wall of flak that they could not control. For a group of men, trained to believe they were the best and incredibly self-confident, the natural tendency was to blame their peers for getting shot down because of some mistake or imperfection in their flying. This is an underlying premise behind Ken Bell's memoir of his one hundred Rolling Thunder missions. Bell continually sought perfection in his flying, and expected the same from those around him. His writing foreshadowed other pilot losses by noting small gaps in their professionalism, teamwork, decisiveness, or conformity in their flying. "From the outset, our flight leader was a bundle of nerves, and his anxiety showed during the mission." After demonstrating indecisive leadership, "'Jesus,' I thought, 'this guy's days are numbered!'" Another young pilot, who Bell labeled the "wayward wingman," demonstrated a lack of attention to proper formation spacing. Both pilots were shot down within days.[12] F-4 pilot Richard Hamilton scrutinized the actions of downed airmen to learn from their errors, which bolstered his

---

[11] Smith, "Robert W. Smith Autobiography," 174.

[12] Bell, *100 Missions North*, 86-90.

own sense of control. “If someone crashes or if someone makes a mistake and does something wrong, you look at what the guy did. And you look at, you try and go through it in very logical, piece by piece manner and say where is it he screwed up? And then you say if I ever get there, I’m not going to do it.”[13] North Vietnam’s formidable defenses, especially in Route Pack Six took a steady toll of the very best flyers, shaking the flyers’ self-confidence and sense of control.

Even the most experienced flight leaders were not invulnerable to antiaircraft guns, which led airmen to adopt other palliative measures to give them a sense of control. Maj Robert Piper, a 100-mission F-105 veteran observed that “after a few missions, one realizes that it is a big crap-shoot. There were of course, things that you could do wrong, but generally it was a random selection process that determined who got it and who didn’t. Pilots would get shot off your wing doing the same thing you were doing. Their only error was being in the same piece of air where the shell exploded.”[14] Historian Richard Holmes observed that soldiers prefer to cope with fear in combat through direct action, either through escape or through aggression. When action to escape or eliminate the source of danger is impossible soldiers resort to palliation, which can take the form of denial, rituals, talismans, fatalism, alcohol, drugs, prayer, or humor as means to cope. [15] During an attack dive, pilots were unable to jink and had to stay focused on target. This surrender of agency to chance when facing antiaircraft guns spurred several forms of palliation, returning an illusion of control. All of Holmes’ forms of coping with fear (with the exception of drugs) are evident in aviator’s accounts of Rolling Thunder. Talismans, superstitions, and good luck rituals were common coping mechanisms. Piper noted that Thud pilots “became,

---

[13] Hamilton, interview, 40-41.

[14] Robert B. Piper, “First Blood,” in *Life on the Line: Stories of Vietnam Air Combat*, by Philip D Chinnery (New York: St. Martin's Press, 1988), 30.

[15] Holmes, *Acts of War: The Behavior of Men in Battle* (New York: Free Press, 1986), 223, 231.

very superstitious. They would have established routines that they would go through before a mission and it was almost worth your life not to interrupt these routines." He reported seeing a pilot thrown off the flight line van because another pilot claimed he was sitting in his "special seat."[16] G.I. Basel wrote that "none of us were superstitious, you understand, but it just doesn't make sense to tempt fate. We wore Buddha Pins, a curious Thai butterfly button, rabbit's feet, shark's teeth, and any other thing that might help. I had a gold coin that I was sure was the reason for my exemption from being hit."[17] Many pilots grew large, out-of-regulations handlebar mustaches that were supposed to render them bulletproof. Veteran flyers advised new pilots to start a mustache immediately upon arrival. Ed Rasimus watched his commander direct a new lieutenant to grow a mustache right away. "That's an order. It's for your own good. A mustache makes you bulletproof. Look at all the mustaches in this squadron. You don't see those people getting shot down."[18]

The loss of some of the very best and most experienced pilots could shake the confidence of an entire base. Robert Smith was an F-105 squadron commander at Korat in November 1967 when the 388th TFW lost all three of his bosses, Cols Burdette, Flynn, and Bean—the entire senior leadership of the wing—in only three months. Their losses rattled his core pilot beliefs in the virtues of being in control and a skilled pilot. Trained as a test pilot, Smith tried to look at the problem analytically. "Ground attack is luck based, which is a lot tougher on the psyche [than air-to-air fighting]. If a pilot did the job to the best of his ability, there was nothing to influence his probability of getting home, except his ability to avoid an accident. One thing about chance is that

---

[16] Piper, "First Blood," 29-30.

[17] Basel, *Pak Six*, 40.

[18] Rasimus, *When Thunder Rolled*, 203.

every occurrence stands on its own. Nothing displayed the lack of associative properties of probabilities, thus the uncertainty of risks, more than our loss of that entire staff within a few months of their arrival."[19] Smith's assessment, if taken to extremes could undermine the fundamentals of confidence, preparation, and the drive to be the best. On the other hand, Hamilton and Bell's beliefs on complete responsibility and control were untenable given the magnitude of the threats in Route Pack Six. Pilots had to take back a degree of control by how much threat exposure they were willing to accept, which they traded against their mission effectiveness.

In the target area, pilots could only regain a real degree of control (and influence probabilities) by avoiding the smaller guns and staying farther away from the medium guns by dropping bombs from higher altitudes. In 1966, F-105s released their bombs from 3,500 to 4,000 feet above the target to maximize the chances of a hit, but the dive pullout put them 1,000 to 2,500 feet below release altitude directly over the target, and in range of every gun in the area.[20] A shift to higher bomb-release altitudes accompanied the shift to higher ingress and egress altitudes in 1967. Several wing and squadron commanders had long advocated this shift to cope with the ROE crisis, so that by the end of the year, the fighter wings were dropping their bombs from 7,000 feet and pulling out of their dives above 4,500 feet. This substantially reduced the risk over the target, but cut accuracy by half or more.[21] Wings traded away mission effectiveness to

---

[19] Although the wing's leaders were not downed by antiaircraft guns (Flynn and Burdette were hit by surface-to-air missiles on October 27 and November 18, and Bean was hit by an air-to-air missile on January 13), guns were most problematic over that period. The wing lost twenty-eight Thuds in October to January: eleven to guns, eight to MiGs, seven to SAMs, and two to mishaps. Smith, "Robert W. Smith Autobiography," 191-192; Hobson, *Vietnam Air Losses*, 119-135.

[20] Rasimus, *When Thunder Rolled*, xii, 75, 235.

[21] This inversely proportional relationship considers attacks using the same dive angle, weapon and airspeed.

lower risk. This trade placed two core beliefs at odds—the drive to excel, compete, and win (by hitting the target), which conflicted with the belief in oneself and desire to assert control over the defenses (by flying higher). As already discussed, successful commanders like Robin Olds had to lead by example to reconcile this value conflict among their pilots.

SAMs: "They Chased You Down to Kill You"

The shift to higher altitudes could only take place after fighter crews learned how to deal with North Vietnam's daunting network of surface-to-air missiles. At the onset of Rolling Thunder, fighter pilots were unprepared to deal effectively with guided missiles, and hoped their sharp reflexes and maneuverable fighter aircraft would enable them to dodge the SAMs. Early losses to SAMs drove fighter pilots to low altitude to avoid the missiles, exposing them to the withering antiaircraft fire already discussed. Optimism in one's flying skills fell short as respected flyers fell to Vietnamese guns and missiles. Piloting skills were beyond the task and it took technological innovations and the expertise of electronic warfare officers, rather than fighter pilot skills and agency to provide an effective counter in a battle against invisible radar beams and remote-controlled missiles that flew three times the speed of sound. Fighter pilots ultimately had to surrender some of their independence and control to technology (electronics and black boxes), technicians (who developed the black boxes and tactics), and electronic warfare officers (who supplied vital inflight expertise), which created a sanctuary for high altitude operations over North Vietnam.

The Soviets first deployed the SA-2 system in 1958, and provided the system to the North Vietnamese in early 1965. Barely a month after the raid on Xom Bang, American reconnaissance discovered the construction of a surface-to-air missile site fifteen miles southeast of Hanoi on April 5, 1965. The North Vietnamese were installing a Soviet-provided SA-2 missile system that

fired thirty-five foot-long missiles with four-hundred pound warheads at aircraft up to seventeen miles away. The missile was capable of traveling over three times the speed of sound to altitudes over 83,000 feet (few aircraft in Rolling Thunder flew above 30,000 feet).[22] A large trailer-mounted radar set (code-named Fan Song) tracked target aircraft with a pair of radar beams and then steered SA-2 missiles to an interception point with a guidance signal, similar to that of a remote-controlled model airplane.[23] The North Vietnamese built early missile sites in a distinctive Star of David pattern with six missiles loaded on launchers surrounding the Fan Song in the middle, but quickly built less obvious sites to hamper detection. The radar had a blind spot at low altitude and the missiles could not be fired at aircraft less than five miles from the site, so SA-2 sites were well-protected by antiaircraft guns to protect their vulnerable zones. Commanders requested the ability to strike the SA-2 sites before they became operational, but as already described, Secretary McNamara denied the requests fearing escalation and holding naive expectations of reciprocal restraint by the North Vietnamese.

American fighter pilots did not know what to expect in potential encounters with surface-to-air missiles before the war. SA-2s downed American U-2 reconnaissance aircraft over the Soviet Union in 1960 and Cuba in 1962, but these high-flying planes were very un-fighter like.[24] They flew straight and level at extremely high altitude and had no potential to dodge a missile due to the thin air and their long spindly wings. Fighter pilots hoped that their agile aircraft would

---

[22] Major John C. Pratt, *Air Tactics Against NVN Air Ground Defenses: December 1966-1 November 1968*, CHECO Contemporary Historical Evaluation of Combat Operations, August 30, 1969, 1, Air Force Historical Research Agency, Maxwell AFB, AL.

[23] Fan song was the code name for the radar and was inspired by the radar's wide fan-shaped beams. The back and forth sweeping of these beams generated a distinctive "fanning" sound in the radar receivers of some U.S. aircraft

[24] In 1960, an SA-2 downed Francis Gary Powers' U-2 over the Soviet Union, and in October 1962, an SA-2 killed Maj Rudolph Anderson during a reconnaissance mission over Cuba. Maj Anderson was posthumously awarded the first Air Force Cross by order of President John F. Kennedy.

enable them to outmaneuver any SA-2 missiles fired at them. In 1963, the pilots in Richard Bach's fighter squadron were uncertain about the growing missile developments in Eastern Europe. "We talk about missiles every once in a while, discussing the fact of their existence and the various methods of dodging them. But dodging is predicated on knowing that they are chasing, and during a strike we will be concentrating on the target, not worrying about the fire or the flak or the missiles thrown up against us." Despite the uncertainty and potential difficulties, Bach tried to remain optimistic about his chances: "we will combine our defense with our offense, and we will hope."[25]

Given the limited electronic technology available in the early 1960s, TAC pilots had few other options but to rely on their own skills. SAC elected to equip its high-flying, non-maneuverable B-52 bombers with powerful electronic jammers to counter SAM radars. These big bombers had the space and electrical power to accommodate an electronic warfare officer (EWO) dedicated to protecting the aircraft with a suite of powerful electronics. Fighter aircraft were tightly limited on space, making it difficult to incorporate an effective electronic solution, so TAC crews planned to rely on their fighter aircraft's speed and freedom to maneuver and their piloting skills against the missiles. TAC was slow to seek technical solutions for its fighters, although it began experimentation with a small jamming pod that hung under a fighter's wings in the place of a weapon.[26] TAC also opted for teamwork in the air by loading electronic countermeasures and electronic warfare officers into the belly of a light bomber, the EB-66 Destroyer to escort fighter missions. But the EB-66 was slower and more vulnerable than the fighters (described by one crewmember as "a big, lumbering, heavy airframe with very little thrust"), so it needed to stand-

---

[25] Bach, *Stranger to the Ground*, 127.

[26] Momyer, *Airpower in Three Wars*, 126.

off outside air defenses diminishing the power of its jamming equipment.[27] Two squadrons of EB-66s, operated from Takhli and then Korat AB, Thailand. Pilots and electronic warfare officers bravely flew over North Vietnam in their aging but essential aircraft to support fighter and later bomber strikes over North Vietnam. They provided unique electronic reconnaissance and radar jamming otherwise unavailable to Rolling Thunder' fighter pilots.

Despite their unique expertise in electronic warfare, the EB-66 crews' expertise often went unheeded by Seventh Air Force's self-reliant fighter pilots. On July 23, 1965, an EB-66 Destroyer crew detected SA-2 radar signals coming from a site in North Vietnam, indicating that the SAM sites first detected in April were close to becoming operational. The navigator aboard the EB-66 recalled Lt Howie Shorr "was the first Raven [EWO] on our aircraft to get cuts on the Fansong radar." After accurately plotting the location of the SAM site "Howie was a shining star for about a week." His find was only appreciated by his fellow EWOs because the commanders in Saigon failed to act on the warning. Unfortunately "7th Air Force didn't believe us until a flight of F-4Cs was almost obliterated by the very same batteries we had discovered. Then they had us flying around the clock."[28] SAMs scored their first kill the day after Shorr and his crew detected the radar signals; on July 24, a Fan Song guided three SA-2 missiles towards a flight of four Air Force F-4C Phantoms near Hanoi. Although the crews observed the missile's smoke trails, one of the missiles scored a direct hit knocking down a Phantom and crew.

With their lethality demonstrated, SAMs became a cause of great concern to Rolling Thunder crews. One young F-105 pilot felt prepared to counter familiar defenses: "enemy

---

[27] The EB-66 was further hampered by its radios. Once it began radar jamming, the Destroyer's radios became unusable due to electronic interference, and its crews were unable to hear radioed warnings of approaching MiG fighters. Marshall L Michel, *Clashes: Air Combat Over North Vietnam, 1965-1972* (Annapolis, MD: Naval Institute Press, 1997), 34; Hendrickson, interview, 8.

[28] Wolfgang W. E. Samuel, *Glory Days: The Untold Story of the Men Who Flew the B-66 Destroyer into the Face of Fear* (Atglen, PA: Schiffer Pub, 2008), 193.

aircraft could be fought. They were simply men in machines," and "flak could be countered by jinking." He felt less prepared to face guided missiles. "But SAMs were something different. They were faster than enemy planes and carried a much larger bang than antiaircraft fire. They were guided by radar and homed in on you…They chased you down to kill you."[29]

As fighter pilots gained experience opposing SAMs in battle, the fighter community refined its tactics to dodge the guided missiles. At launch, a SAM produced a bright flash and cloud of smoke at the launch site. A bright flame trailing a thick smoke trail propelled the missile towards the intended target. Aircrews called out SAM launch sightings over the radio to help other crews locate the attack. One F-105 pilot described an oncoming SAM as a "black bowling ball" surrounded by fire.[30] Another Thud pilot recalled "if you could see the plume, the flame of the rocket, you were okay. You knew he wasn't going towards you or towards your flight or towards your strike force, and he would slide by. You really got worried when the former plume of rocket fire disappeared. Now you knew it was coming directly at you."[31] Crews learned to "take it down," meaning they initiated a steep dive below SAMs approaching them to either break the SAM radar lock by flying close to the ground or to force the missile to turn downwards to follow the aircraft. Once the missile committed its course downwards to follow, fighter pilots reversed directions and pulled back up. Since the SA-2s flew at high speeds and had small wings, the missiles were unable to follow a well-timed turn reversal. This maneuver returned a degree of control, and a well-timed maneuver improved one's chances of survival greatly.

---

[29] Rasimus, *When Thunder Rolled*, 87.

[30] Lt Gen Spence "Sam" Armstrong and Lt Gen Michael Nelson, "Dodging Missiles," *Airspacemag.com*, accessed April 25, 2009, http://www.airspacemag.com/multimedia/40351592.html.

[31] Flynn, interview, 138.

Sighting a SAM was absolutely essential to avoid it, so both sides adapted tactics and technology to facilitate the SAM vs. fighter duel. Flight in or just above cloud layers was very hazardous for aircrews in areas defended by SAMs. F-4 pilot John Nasmyth recalled that near Hanoi "flying over an undercast was taboo" because the clouds masked the brilliant flash and telltale smoke that signaled a SAM launch.[32] Crews had to keep a sharp eye out and at least 10,000 feet of height above a cloud layer to have any hope of spotting a missile breaking out of a cloud deck and avoiding it. If they flew too high, however, the danger increased because the missile's motor would burn out and the missile became very hard to see. Robin Olds observed that "the higher you go, the harder those things are to dodge because the harder they are to see. You know, the burn out is gone and you're just lucky if you see them coming."[33] The SAM operators learned to launch multiple SAMs from several directions to attract attention in one quadrant and then slip a missile in unseen from another direction. It took discipline for a flight of fighter pilots to sustain their lookout through 360 degrees with one or more SAMs bearing down and drawing attention from one direction.

Sharp lookout and superb flying, however, were not enough to negate the SAM threat. Three key technological improvements: radar warning gear, radar jammers, and specially equipped SAM-hunting aircraft and crews steadily diminished SAM effectiveness throughout the campaign, but also changed how pilots experienced the war in the air and began to change fighter culture. Radar warning gear altered how pilots sensed danger, electronic jamming pods led fighter pilots to reluctantly surrender some of their agency to "black boxes" that put out invisible beams, while SAM-hunting aircraft and crews initiated a close partnership between fighter pilots

---

[32] Nasmyth, *2355 Days*, 18.

[33] Brig Gen Robin Olds, interview by Maj Geffen and Maj Folkman, est. 1968, 68, Air Force Historical Research Agency, Maxwell AFB, AL.

and SAC-trained electronic warfare officers, altering the single-seat, single-engine fighter pilot mystique by granting an important degree of control to a non-pilot aviator. These innovations, among several others substantially reduced the risk posed by SAMs. In 1965, the Vietnamese fired an average of eighteen missiles to achieve one kill against an American aircraft. In 1966, it took twice the effort: thirty-five missiles to bring down an American aircraft. By 1967, the rate tripled to fifty-seven missiles per kill, and from January to March 1968, Rolling Thunder's final months against Route Pack Six the North Vietnamese achieved one kill per 107 missiles, or one-sixth the effectiveness of the early efforts in 1965.[34]

Pilots learned to sense danger through electronic warning gear that alerted them to look for SAMs. The F-105s were equipped with warning receivers called "vector boxes" that generated bright strobes on a small oscilloscope to indicate the strength and direction of threatening radar signals.[35] The system included a set of warning lights that indicated the type of radar looking at the aircraft, a warning light that indicated the presence of a missile guidance signal, and a light indicating a signal accompanying the active control of a missile in flight. Audio warnings fed into the pilots' headsets as an additional form of warning when a pilot could not look inside the cockpit.[36] In situations where there were one or two radars looking at the aircraft, the radar warning gear could be invaluable. But the North Vietnamese steadily increased their defenses, and in very high-threat situations the warning gear become saturated with multiple strobes forming a spider-like picture yielding little useful information. Ken Bell describes how his set became unusable deep in Route Pack Six: "the radar warning display looked like it was

---

[34] Momyer, *Airpower in Three Wars*, 136.

[35] Air Force F-4C Phantoms initially lacked this technical gear, and received radar warning sets in late fall 1966. Michel, *Clashes*, 66.

[36] Rasimus, *When Thunder Rolled*, 90-91.

growing hair with dozens of warning strobes that were impossible to interpret. The SAM launch warning flashed on constantly. I was tense and scared, my mouth dry as cotton."[37] Despite their limitations in the most threatening situations, crews eagerly accepted radar-warning receivers as a means to increase the effectiveness of their defensive reactions. The warnings could cue the crew to maneuver, but the reaction was still entirely dependent on the crew's flying skills.[38]

Compact wing-mounted pods designed to jam the Fan Song radar were a second technical innovation, but the pilots were reluctant to bet their lives on this new technology, and it only gradually gained acceptance. Initially available only in small numbers, jamming pods (named QRC-160 for "quick reaction capability") became widely available to the F-105 wings in 1967. The pods received an uneven reception in the theater as each wing adopted different philosophies regarding this new and unproven technology. F-105s and F-4s had to devote a weapons station to carry the pod, sacrificing a bit of mission effectiveness. When Maj Odom, the test EWO responsible for the pods first briefed Takhli pilots that their new pods had replaced a bomb for the morning mission, "there was an immediate and very loud response of booing from the pilots" because the pilots believed fewer bombs "reduced the probability of success for the whole mission."[39] The pilots were loath to undermine their potential mission effectiveness to improve their defenses, indicating their high motivation for their mission in the fall of 1966.

Pilot interest in the jamming pods was undermined by the fact that non-pilot electronic warfare officers (EWOs) explained and advocated their use. The EWO and fighter pilot communities had little in common; EWOs wore navigator wings and most came from SAC.

---

[37] Bell, *100 Missions North*, 91-93.

[38] Michel, *Clashes*, 66.

[39] This story was related by Joe Telford, a test engineer present at the briefing. Edward T. Rock, ed., *First in, Last Out: Stories by the Wild Weasels* (Bloomington, IN: AuthorHouse, 2005), 439.

Many came from bomber crews, and as will be covered in Chapter Eight on Arc Light, enjoyed the lowest status of the five officers on a B-52 crew. Their expertise in the highly technical and arcane world of electronic warfare set them apart from the highly competitive, assertive, and self-confident fighter pilots. When Capt David Zook, an EWO associated with early jamming pod testing, briefed Takhli's pilots on how the wing's pilots could make effective use of the QRC pod, Robert Scott, the F-105 wing commander, became concerned the message would be lost due to the messenger. Zook recalled Scott cautioning him to "keep it in as 'fighter pilot' sounding language as possible and not to sound like I was addressing engineers."[40]

Zook precipitated a successful combat trial in October 1966, after which 388th TFW pilots at Korat quickly embraced the pods, once they became available in sufficient numbers. Equipped with the pods, Korat crews moved their ingress altitudes to medium altitude between 15,000 and 18,000 feet putting them above most of the PAVN's antiaircraft guns. This move put their F-105s into thinner air, depriving them of a fighter's traditional reliance on maneuverability, in favor of technology and teamwork.[41] Pilots placed a life or death bet on this small piece of electronic technology that did its job with invisible radar signals. The only indication a pilot had that his pod was working was a small indicator light in the cockpit, and with the early pods, there were frequent electronics failures.[42]

---

[40] Lt Col David S. Zook, "Seven Years of Vietnam a Raven Goes to War," 9, accessed May 9, 2009, http://freepages.military.rootsweb.ancestry.com/~ocs60c/Zookraven.htm.

[41] Curiously, the first test was conducted by the 355th TFW at Takhli, the later of the two F-105 wings to shift to high altitude. Michel, *Clashes*, 60-62.

[42] William Norris noted that "the reliability when we first got them was really bad. In fact, until I left in August, we still had a lot of trouble with the pods. We had a pod check just before going on the tank[er]s. Each flight commander would have a pod check, and at that time each flight member would call in 'two green' or 'one green and one red.' I would say that most of the time we didn't have all 'green' pods. In most cases there was at least one member with a pod out." Norris, interview, 31; Col Donald R. Spoon, interview by James C., Dr Hasdorff, June 18, 1991, 19.

Flight at higher altitudes within the range of SAMs required intense teamwork, faith in one's companions, and a near complete surrender of individual agency—the last requirement representing a considerable break with traditional fighter ethos that valued individual control and freedom to maneuver. Zook and a retired EWO named "Inky" Haugen found that single aircraft with a jamming pod could be tracked and attacked by Fan Song operators; they could launch a missile at the narrow jamming signal produced by a single jamming pod and still score a hit. But more significantly, Zook and Haugen found that a flight of aircraft jamming in a rigid, but precisely and closely spaced formation could combine their jamming to create a broad wedge of interference on an operator's scope. SAM operators could launch missiles towards these formations called "pod formations" (because they maximized jamming pod effectiveness) but their missiles had a very low probability of achieving a hit due to the wide, solid jamming pattern.[43]

Flight in rigid pod formations while under missile fire surrendered a fighter pilot's ability to exploit the freedom of flight through maneuvering, and fighter pilots only reluctantly surrendered their individual control to fly as part of a large inflexible formation. Bombers had traditionally flown in closely-spaced and rigid formations, and now fighter pilots had to adopt some of the rigid bomber tactics that they had derided for years. Although he never had to fly a rigid jamming formation, Gen William Momyer, the Seventh Air Force commander captured the difference in attitude when asked if he could ever see himself piloting a bomber: "I wanted to make my own decision[s] and I wanted the maneuverability, the feeling of independence, the feeling of pursuit and engagement that I got from fighters that I could never get from bombers."[44]

---

[43] Zook and Haugen calculated that the SA-2's probability of a hit went from 97 percent against a single target to 4 percent against a formation using jamming pods. Samuel, *Glory Days*, 235.

[44] Gen William W. Momyer, interview by Lt Col John N. Dick, Jr., January 31, 1977, 30.

Yet fighter pilots understood that strict formation discipline benefited all while sloppiness or individual reactions to SAMs endangered all because they could break apart the jamming wedge. Robin Olds related the nerve-wracking experience of holding formation under a missile attack. "You just sit there and wait, wait, wait, wait and wait and hope it's going to go after somebody else but if it doesn't, then you duck at the right time, because the reason for going in formation as we did was because we were enjoying the redundancy in coverage given us by all those QRC-160 pods working in unison."[45] Along with the surrender of individual agency, pilots lost their radar warning, further degrading their ability to maneuver without adequate warning. With the pods turned on, electronic interference rendered the radar warning receiver unusable because the pods jammed the warning gear.[46]

Even though they ran the initial F-105 test with Dave Zook, the 355th TFW's F-105 pilots at Takhli were reluctant to bet their lives on the new jamming pods. Takhli pilots only gradually came to rely on their pods, and inched their operating altitudes to 6,500 feet at first, and then to 8,000 to 12,000 feet throughout the year in 1967, adopting similar tactics to Korat only by the late summer. These altitudes allowed for a quick return to low altitude to dodge SAMs and kept the F-105s at an altitude that they could effectively maneuver.[47] The difference in tactics between the two wings were most pronounced in spring 1967 and attracted Gen Momyer's attention. Takhli pilots argued for autonomy and flexibility to preserve their tactical ideas and retain local control. Takhli F-105 squadron commander William Norris admitted to mistrusting the QRC pod at first, "I don't think we put the faith in the QRC that Korat did. And as the QRC proved to be more

---

[45] Olds, interview, 56.

[46] Norris, interview, 32.

[47] Michel, *Clashes*, 62.

successful against the SAM, I think we then adopted Korat's tactics more." But he appreciated that Seventh Air Force allowed the wing control over its own tactics. "We were allowed to go ahead at Takhli with a modified version of the Korat tactics, and I think this was healthy. I commend General Momyer, because I think we needed a variation [from] everybody doing the same thing."[48]

The Air Force fielded a third, and very dramatic technical innovation with the introduction of specially equipped aircraft and missiles designed to detect and attack SAM radars. The mission was very dangerous, but appealed to the fighter pilot preference for freedom and autonomy in hunting a difficult adversary, and earned the respect and praise of other fighter crews. Called "Wild Weasels," an elite group of experienced fighter pilots and EWOs trained to operate fighters modified to detect and locate electronic signals, and lead attacks on the source of the signals. A month and a half after the first SAM shot down an American jet over North Vietnam, the Air Force opened a contract for the first set of gear designed to locate and home in on radar signals. With unprecedented haste, engineers developed and equipped a flight of two-seat F-100F Super Sabres, which first entered combat only four months after the first SAM engagement. Manned by select and highly experienced fighter pilots and former SAC EWOs, the first Wild Weasels went into combat over Vietnam on December 1, 1965 and Captains Alan Lamb and Jack Donovan led four F-105s to the first kill on a SAM site on December 22. Once Lamb and Donovan located the camouflaged SAM site, the F-105s attacked it "like two dogs on a bone,"

---

[48] Robin Olds, commander of the F-4 equipped 8th Tactical Fighter Wing, had a less charitable assessment of the 355th's approach. Olds believed that the 355th wing's competition and self-confidence had slid into closed-minded arrogance, and criticism of the other units and ideas which inhibited learning. "Nobody was fighting as hard as they were fighting the war over Route [Pack] 6." But in Olds' opinion, the 355th's leaders seemed to espouse that "everybody else was wrong and they were the only ones who were doing it right and anyone else stunk and they were the only ones that were good." Brig Gen Robin Olds, interview by Lt Col John N. Dick, Jr. and Lt Col Gordon F. Nelson, February 17, 1977, 91, Air Force Historical Research Agency, Maxwell AFB, AL; Col William C., Norris, interview by Lt Col Paul C. Wieland, February 1, 1971, 7-9, Historical Research Agency.

shattering the site. Short range ordnance, cannons and 2.75 inch rockets, made these early F-100F missions very hazardous. Attacking his third SAM site with twenty millimeter cannons in March, Lamb's EWO groused "there has to be a better way."[49]

In June and July 1966, modified two-seat F-105Fs equipped with longer-range radar-homing missiles replaced the F-100Fs. The F-105 wings welcomed the arrival of the Wild Weasels, whom they tasked to protect the strike missions from SAMs. The Weasels preceded the strike forces into North Vietnam to identify and then tie up the SAM sites throughout the strike. Wild Weasel crews intentionally exposed themselves to draw the attention of the SAM operators in a deadly game of cat and mouse. The F-105Fs normally carried two AGM-45 Shrike missiles that homed in on radar signals. With a Shrike in the air, SAM operators had to choose between guiding any of their SAMs in the air with their Fan Song radar and risk being hit by the Shrike, or to shut down the radar to preserve themselves. This was an extremely hazardous mission for the F-105 crews, in part because the Shrike was still a short range weapon—it had a five to seven mile range versus the SA-2's nineteen mile range.[50] Wild Weasels jousted day in and day out with a shorter lance, until the arrival of the longer range AGM-78 in 1968.[51] Due to the severity of the threat in Route Pack Six in mid-1966, Takhli lost five of its initial six F-105Fs within two months.[52]

---

[49] Alan Lamb, "The First Wild Weasel and the First SAM Kill," in *First In, Last Out: Stories by the Wild Weasels*, ed. Col Edward T. Rock (Bloomington, IN: AuthorHouse, 2005), 92-97.

[50] Edward T. Rock, "Wild Weasel III-2 Memories," in *First in, Last Out: Stories by the Wild Weasels*, ed. Edward T. Rock (Bloomington, IN: AuthorHouse, 2005), 232.

[51] National Museum of the USAF, "Fact Sheet: AGM-78 Standard Antiradiation Missile," accessed February 10, 2010, http://www.nationalmuseum.af.mil/factsheets/factsheet.asp?id=6004.

[52] Rock, "Wild Weasel III-2 Memories," 238.

Despite the dangers posed by the Air Defense Command's interlocking defenses of SAMs, MiGs, and guns, Weasel crews were supremely confident in their highly-refined abilities and remained dedicated to their mission because of the freedom they enjoyed, the respect of their peers, and the protection they afforded their fellow aviators. Highly decorated Weasel EWO Mike Gilroy summarized it this way: "the SAM usually has another site providing him overlapping coverage, as well as dozens of antiaircraft guns…He also has six missiles that can go twice as far and twice as fast as our Shrikes." Although he was outgunned, outranged, and outnumbered, Gilroy was confident in his ability to control the confrontation, and his comments reflect the Wild Weasel's supreme sense of control founded on their skills and expertise: "still we feel we have the advantage as long as we don't screw up, like losing sight of the missiles, getting too slow, or too stupid."[53] The Weasels placed their mission to protect the force above all else. Their motto was "first in, last out" pointing to an ethos that accepted risks on the behalf of others. Mike Gilroy noted that despite the Weasel losses in late 1967, he was proud of his personal record: "so far we have never lost a wingman and more importantly, never had a strike pilot shot down by a SAM when we were flying cover for them."[54]

Although Wild Weasel pilots shared control with their back-seaters, they enjoyed their mission because they were free to fly their aircraft as they saw best, devise imaginative tactics and fulfill a mission they believed in and were highly respected for. Recognizing their back-seaters' unique skills and knowledge, Weasel pilots willingly entered a partnership that shared control of the mission, which was a significant departure for many from the traditional "single-

---

[53] Mike Gilroy, "Single Ship Iron Hand," in *First in, Last Out: Stories by the Wild Weasels*, ed. Edward T Rock (Bloomington, IN: AuthorHouse, 2005), 174. Gilroy may have been the highest decorated EWO. He was with Merlyn Dethlefsen on March 10, 1967, when Dethlefsen earned the Medal of Honor. Gilroy was awarded the Air Force Cross.

[54] Ibid., 167.

seat, single-engine" fighter pilot ethos. Weasel crews had almost total freedom in devising tactics to support the strike force. Because they preceded the strike force, Weasels were fairly unconstrained in where they flew; maneuvering fluidly in response to radar signals and positioning themselves to best protect the strike force, which followed a structured route in and out of the target area. The freedom to exercise complete agency over their mission and to exploit the flexibility of their fighters appealed to their combat aviator ethos. Weasels crews enjoyed the fullest measure of power, control and freedom of any group in Rolling Thunder. They accepted the highest risks and enjoyed the greatest freedoms. They also earned greater respect from their peers; because the Weasels accepted considerable risk on the behalf of others and provided a highly valued capability, they were highly respected by their fellow strike pilots, which all contributed to high motivation despite high Weasel losses.

Wild Weasel EWOs nicknamed "bears" or "pit bears" for their location in the back seat or "pit" enjoyed status and experiences vastly different from the SAC background most of them came from. As will be discussed in the section on Arc Light, SAC EWOs were underutilized and garnered little respect as part of B-52 crews in peacetime training and throughout most of the war because the aircraft operated away from most threats. They were also subject to SAC's regimentation. Mike Michaels volunteered for Wild Weasels in 1967, noting that "although I was proud of my 1,500 hours in the B-52G/H it was mind-numbing to sit seven-day ground alert…I was eager to get away from the checklists and constant standardization."[55] In the Wild Weasels, EWOs became the center of attention because they had to evaluate and interpret dozens of radar signals, direct their pilot, and warn their flight and the strike force of potential threats. The application of their unique electronic warfare expertise, although not widely understood, was

---

[55] A. L. Mike Michaels, "An Unforgettable Character," in *First in, Last Out: Stories by the Wild Weasels*, ed. Edward T. Rock (Bloomington, IN: AuthorHouse, 2005), 221.

universally appreciated by Weasel pilots and the rest of the strike pilots. Liberated from their enclosed, windowless station on the B-52, bears appreciated far greater measures of flight's inherent power and freedom from their seat in the F-105F. Michaels wrote that the F-105 "was a new world for me flying fast and being able to see where I was going.[56] EWOs shared a far greater degree of control over the SAM-hunting mission due to their unique expertise and were valued partners to their front seat pilots. This is a far different relationship than that experienced by back-seat pilots in the F-4 who were junior and less seasoned than the pilot in the front seat. They had little to offer their front-seaters. EWO Paul Lew Chesley enjoyed the ability to outthink his antagonists on the ground. "Weaseling has been described as three-dimensional chess where cheating [is] not only authorized but encouraged, and the loser dies." Although his back seat in the F-105 was filled with electronic scopes, he saw himself fighting other men: "we are not working against a mechanical device. You are working against several human minds in a console that is working against you. Just that simple. He is trying to kill us. We are trying to kill him." The freedom of flight in fighters and the freedom of thought inherent to the mission was liberating and appealing compared to the restrictive environment of the B-52. "It was quite thrilling. And I had a window to look out of. [In] The B-52, I was in a cubbyhole, dark. It was cathode ray tubes, and twinkly lines, and funny sounds, and so forth. But [in the F-105] I could think three dimensionally."

Chesley and his fellow airmen who flew in Rolling Thunder had to think three dimensionally to counter a growing threat that could strike them from any direction. Throughout 1967, U.S. fighters encountered increasing opposition by North Vietnam's small force of Soviet-built MiG fighters. The resultant battles between formations of jets that averaged nine-mile-per

---

[56] Ibid., 222.

minute speeds featured countless unexpected encounters, rapidly changing reversals, intense physical exertion, and sudden, often violent terminations. Unlike ground-based SAMs and antiaircraft guns that came from known locations on the ground, MiGs could (and did) come from any direction and any altitude. Paul Chesley had to cope with MiG attacks in spring 1967 when the North Vietnamese began to commit large formations of fighters against Air Force fighter formations in an effort to inflict prohibitive losses.

MiGs: "Ah Glory!"

On April 19, 1967 a large force of a dozen or more nimble MiG-17 fighters tore into Kingfish flight—a flight of four F-105 Wild Weasels led by Maj Leo Thorsness and his back-seater Capt Harry Johnson, who were supporting a strike southwest of Hanoi. The MiGs knocked down Kingfish 2 and scattered Chesley's two-ship element, Kingfish 3 and 4, who lost formation integrity and had to run out, every man for himself, at low altitude to escape. Thorsness and Johnson were suddenly on their own as they attempted to organize a rescue of Kingfish 2 amidst a formation of hostile MiGs. A MiG appeared to line up for an attack on one of the crewmembers of Kingfish 2, still descending in a parachute. Johnson and Thorsness called out the location of nearby MiGs to each other as Thorsness maneuvered for a twenty millimeter cannon attack on the MiG approaching their comrade. Thorsness later wrote "at 500 mph, I quickly overtook the MiG. I squeezed the trigger of the Gatling gun, but the one-second 'buzz saw' burst missed." Repositioning, "I pulled the trigger again. This time I saw his wing come apart." But there was no time to savor victory in the lightning fast aerial battle. As the MiG spiraled down and crashed, Johnson called, 'Leo we got MiGs on our ass!'" Thorsness and Johnson dodged the attack, and using the F-105's powerful afterburner and high speed, escaped to refuel and then return an hour

later. Other flights of MiGs, F-105s, and rescue aircraft swirled over Kingfish 2's crash site in a sprawling melee that saw the destruction of one F-105F, one rescue A-1, and four MiG-17s.[57]

The battle on April 19 signaled a resurgence in MiG activity that began in late 1966 to compensate for improving American anti-SAM tactics and technology.[58] The MiGs rose to fill the gaps left by the SAMs and sustained a tenacious air effort in an attempt to inflict prohibitive losses on the Americans. Periods of heavy MiG activity alternated with short operational pauses from October 1966 to the end of U.S. operations north of the nineteenth parallel in March 1968.[59] Heavy fighting led to high MiG losses in January and May 1967, which precipitated short operational pauses for analysis, reconstitution, and retraining in new tactics. A lull in MiG opposition also accompanied a spell of poor flying weather in January and February 1968 in a campaign that otherwise featured a determined effort by North Vietnam's fighter force to contest the skies over Hanoi and Haiphong.

North Vietnam's fleet of MiG fighters garnered significant attention during Rolling Thunder, but, were relatively small in numbers and inflicted few U.S. casualties compared to the

---

[57] Thorsness earned the Medal of Honor and Johnson earned the Air Force Cross for their heroic defense of Kingfish 2. Futrell et al., *Aces & Aerial Victories*, 47, 119; Hobson, *Vietnam Air Losses*, 96; Michel, *Clashes*, 92-95; Leo Thorsness, *Surviving Hell: A POW's Journey* (New York: Encounter Books, 2008), 1-6.

[58] According to the Air Force's analysis of MiG activity up to 1967, "MIG fighter aircraft did not pose a serious threat in the Vietnam conflict before the last quarter of 1966, as only sporadic, unpredictable contact took place between them and U.S. aircraft. The big threats to strike aircraft were active SAM and AAA/AW defense. The MIG threat was only a potential factor, since active opposition in the air was unusual." Lt Charles H. Heffron, *Air-to-Air Encounters Over North Vietnam, 1 January - 30 June 1967*, CHECO Contemporary Historical Evaluation of Combat Operations, November 30, 1967, 1, Air Force Historical Research Agency, Maxwell AFB, AL.

[59] After March, President Johnson limited Rolling Thunder attacks to areas south of the 19th parallel and crews saw little MiG activity in the southern Route Packs. In the six months from April 1 through October 31, 1968 there were only 15 MiG engagements, which resulted in six North Vietnamese and two U.S. losses. Maj James B. Overton, *Rolling Thunder January 1967 - November 1968*, CHECO Contemporary Historical Evaluation of Combat Operations, October 1, 1969, Figure 16, Air Force Historical Research Agency, Maxwell AFB, AL.

antiaircraft guns and SAMs. At the peak of the battle with the MiGs, Air Force pilots engaged MiG fighters 147 times between April 1, 1967 and June 30, 1967—an average of fewer than two engagements per day. During that second quarter of 1967, the chances of being shot down by a MiG were very low. In 147 engagements, Air Force crews scored sixty victories over MiGs at the loss of ten Air Force aircraft. In other words, when Air Force crews engaged MiGs, they knocked down an adversary in four of every ten engagements while losing an aircraft only once in every fifteen aerial battles.[60] Over the first two years of Rolling Thunder, MiGs accounted for only 2.4 percent of F-105 losses, rising to 10 percent of F-105 losses at the peak of the air battle in 1967 and 1968, indicating the North Vietnamese shift towards a reliance on their MiGs as American airmen began to solve problems posed by the SAMs and guns.[61] Although their numbers were small, MiGs constituted a prominent threat and diverted a significant amount of fighter resources to the escort role. To the crews, this was a welcome diversion, because those crews detailed to engage the MiG pilots saw opportunities for glory well beyond that available in a strike role, gave them opportunities to more fully exercise the power, control and freedom in dogfights, and provided the fullest audit of their considerable skills in a contest with an enemy pilot.

North Vietnam's Air Defense Command operated small, maneuverable Soviet-built MiGs. The North Vietnamese Air Force inventory fluctuated between fifty and a hundred fighter aircraft, split between large numbers of aging MiG-17s and limited numbers of high-performance MiG-21s. At twelve thousand pounds gross weight, the diminutive MiG-17 weighed less than a quarter of the weight of the beefy American F-4s and F-105s. Its small size and light weight gave the MiG-17 an extremely tight turn radius unmatched by American fighters. Robin Olds marveled at

---

[60] Ibid., 24, figure 6.

[61] Hobson, *Vietnam Air Losses*, 15-166.

the aircraft's turning ability, which far exceeded his F-4 Phantom's. He considered the aircraft a "vicious, nasty little beast." When he attacked a MiG-17 from behind, its pilot was able to quickly reverse directions and turn a perilous defensive situation into an even-odds head-on firing pass against Olds: "their turn radius has to be seen to be believed. It's incredible."[62] Although the MiG-17 could turn well, it had relatively low thrust and lacked the power and high speeds needed to fight at high or medium altitudes, so it kept to low altitudes. The heavy and fast American fighters needed to keep their speed up and avoid sharp-turning dogfights with the MiG to capitalize on their own strengths and avoid the MiG's strength in turning.

The slightly larger and more capable MiG-21 featured a more powerful engine and a modern delta-wing that gave it a supersonic top speed. Although it could not turn like the MiG-17, its light weight (sixteen thousand pounds) gave it a good turn capability compared to the large and heavy, American fighters.[63] Designed as a single-purpose short-range high-speed interceptor, the North Vietnamese learned to use its MiG-21s to its best advantage at high altitude in high-speed hit and run attacks against the rear of American fighter formations. With a twenty-three foot wingspan (The F-4's wingspan was thirty-eight feet), the Mig-21 had a small profile and was especially difficult to spot when it was pointed nose-on, which made hit and run attacks especially hard to detect. Both aircraft types flew from airfields surrounding the Hanoi and Haiphong areas in defense of the northern route packs.

These two aircraft were far different from American fighters that were big, heavy, and packed with fuel and avionics. The Air Force optimized the F-105 (as already noted) for the

---

[62] Heffron, *Air-to-Air Encounters Over North Vietnam, 1 January - 30 June 1967*, 22; Robin Olds, Christina Olds, and Ed Rasimus, *Fighter Pilot: The Memoirs of Legendary Ace Robin Olds* (St. Martin's Press, 2010), 313.

[63] The F-105 weighed 52,200 pounds at takeoff weight and the F-4 weighed between 51,700 and 53,800 pounds. Knaack, *Encyclopedia of US Air Force Aircraft and Missile Systems*, 205, 285.

nuclear strike mission. It was big and equipped with small wings that enabled high-speed low altitude flight, but made the Thud a poor dogfighter. It could not turn tightly enough to stay with the MiGs it faced, and Thud pilots were well-advised to fly fast to outrun an attacking MiG, turn only when needed to negate a MiG attack, and use the aircraft's accurate twenty millimeter cannon to defend themselves by sniping at unobservant MiG pilots.[64] Al Lenski believed his F-105 was "no match" for a MiG "in air-to-air dog fighting." He assessed "the Migs had the turning advantage, but we had the speed advantage. It was not considered smart to get into a turning, fighting contest with a Mig 17 or 21. Our best tactic was speed, hit and run, but don't get into a dog fight, turning contest."

F-105s carried heavy external fuel tanks and two to three tons of bombs under their wings and bellies, and turned even more poorly than an unburdened (or "clean") F-105, so Thud pilots often had to jettison their bombs when subjected to a MiG attack, negating the purpose of their strike mission. In response, Seventh Air Force shifted their most capable dogfighters, their F-4 Phantoms, from bombing roles to air-to-air escort during periods of high MiG activity. After the war, Al Lenski wrote "having the F-4 Mig Cap meant an awful lot to us F-105 guys as we went into Pack 6. They did one hell of a good job keeping the Migs off of us so we could get to the target without having to dump our bombs to protect ourselves."[65]

The F-4 Phantom, designed as a multi-role aircraft, was more suited to the air-to-air combat role. The F-4 had a bigger wing, more powerful engines, and slightly better rearward visibility than the F-105, making it more suitable for a turning fight in the air. It also carried as

---

[64] Most of the F-105's air-to-air victories resulted from cannon-fire. Air Force records credit the AIM-9 Sidewinder with only three of the F-105's twenty-eight MiG kills. Futrell et al., *Aces & Aerial Victories*, 157.

[65] Lenski, *Magic 100*, 81.

many as eight air-to-air missiles including the long range (twelve mile) radar-guided AIM-7 Sparrow and the shorter range (two mile) heat-seeking AIM-9 Sidewinder.[66] Designers believed the F-4's missiles would dominate future air battles, so early models of the F-4 lacked a cannon.[67] When early-generation missiles fell short of expectations, F-4 crews at Danang adapted by hanging a gun pod under their aircraft, earning the nickname "Gunfighters" for the 366 TFW.[68]

Fighter crews received daily briefings on North Vietnam's guns, SAMs and MiGs, but the pro-forma intelligence briefing seldom provided accurate forecasts of MiG activity. Advanced warnings came from USAF radar surveillance aircraft or US Navy ships stationed along North Vietnam's borders and coasts when MiGs launched to confront American raids. Air Force EC-121 radar surveillance planes called "College Eye" were operated by USAF Air Defense Command crews, circled over Laos and the Gulf of Tonkin, and broadcast warnings of airborne MiGs (called "bandits). The College Eye's airborne radar system had a very limited capability to separate low flying aircraft from radar echoes from the ground, so there were many MiGs the College Eye failed to detect.[69] Because several groups of American aircraft needed to use these

---

[66] The F-4 also carried the unsuccessful Hughes AIM-4 Falcon. The Falcon was a variant of the United States' first guided missiles and proved difficult to use and unreliable in combat. Robin Olds had his wing's aircraft rewired to carry AIM-9 sidewinders after poor experiences with the AIM-4. His disdain for the AIM-4 was unbounded: "we all hated the new AIM-4 Falcon missiles. I loathed the damned useless things! I wanted my Sidewinders back. In two missions I had fired seven or eight of the bloody things and not one guided." Olds, Olds, and Rasimus, *Fighter Pilot*, 314.

[67] Ernest Bedke recalls that the limits of the F-4's impressive new technologies were not widely anticipated before the war. "We weren't really familiar enough with the capabilities of that weapons system to understand that we had problems." Because the F-4 represented a big jump in capability from 1950s vintage fighters, "we were pretty much on cloud nine" and it was not until "months later that we started realizing that maybe we had more problems than we had initially understood." Bedke, interview, 8-9.

[68] Blesse, *Check Six*, 121-126.

[69] After October 1967 U.S. early warning capabilities increased through a modified EC-121 able to detect and fix the position of MiGs and SAMs through passive electronic sensors and computers. This single special aircraft carried a new and highly classified capability that allowed the airmen on board to interrogate Soviet identification friend or foe (IFF) systems and positively identify enemy aircraft as hostile.

warnings at once, College Eye crews called out MiG positions in distance and bearing from a common reference point (called "bullseye") so that all crews could interpret the position and assess the threat. Hanoi served as the bullseye for missions over North Vietnam.

These radioed warnings heightened awareness but also elevated tension and apprehension among fighter crews bound for targets in North Vietnam. G.I. Basel described a MiG warning and his reaction. College Eye's warning: "BANDITS. BANDITS. BULLSEYE. 270 for 15" meant that MiGs (bandits) were airborne, fifteen miles due west of Hanoi (270 bearing, for fifteen miles). Basel and his fellow pilots had to then interpret the meaning of such a warning by mentally plotting their own position relative to Hanoi, compare the relative distances and bearings between themselves and the MiGs to estimate where to look to find the enemy. This demanded high situational awareness and quick and accurate mental estimations. From the MiG warning, Basel estimated the enemy intent and intensified his visual lookout: "the MiGs were coming out to meet us. We were hastening along at 520 knots. I kept slewing the tail of the Thud out of the way so I could look back every few seconds."[70]

Visually searching to the rear of the formation was mentally and physically taxing, as the pilots divided their attention between maintaining formation position, managing their fuel state, preparing their weapons, and physically twisting around in their ejection seats and craning their necks around to see as far behind the aircraft as possible. Seat and shoulder straps, survival kit buckles, and a parachute restricted movement within the cockpit adding to the physical strain of searching for MiGs. The crew's bulky flight helmet, tinted visor, and oxygen mask impeded vision and added weight when under heavy G forces in a turn. Bulkheads restricted visibility directly behind the F-4 and F-105, so crews had to look behind each other to clear each other's

---

The program was named "Rivit Top." Col Thomas W. Morris, interview by Capt Richard B. Clement, February 4, 1969, 13, 19, Air Force Historical Research Agency, Maxwell AFB, AL.

[70] Basel, *Pak Six*, 26.

blind spots. Mike McCarthy loved his F-4 but found the aft visibility a weakness. "The F-4 was a great airplane but the visibility in our vulnerable six o'clock position was terrible." McCarthy strained against these limitations and felt his apprehension rise as MiG warnings neared his estimate of his own position. "Although utterly fearless, I was becoming concerned" as the MiGs came closer and were not in sight. To slide his vulnerable tail around McCarthy kicked his rudders and ailerons: "I skidded and yawed the airplane as I had never done before. If there was a MiG below me in the vulnerable six o'clock low position, where I couldn't see him, I wanted to know! Everyone searched the sky for any glint of an aircraft."[71]

Crews had to search an immense volume of air since attacks could come from any height, from high above the formation or from below and anywhere in between. Effective searching required more than simply sweeping one's eyes back and forth, but required deliberate scanning by focusing the eyes in the distance and searching one small sector at a time. Beyond two or three miles, the small MiG fighters were very difficult to spot unless sun glinted off a reflective surface or the clouds or lighting provided favorable contrast for a visual detection. F-4 pilot Robert Buhrow recalled receiving adequate warnings throughout 1967, but many fruitless searches. "Every time we found MIGs, they usually had a MIG call saying that they were airborne. But then conversely, they also called them airborne many times, more often than not, when we'd look over hell's half acre and never find them."[72]

Aircraft spotted beyond two or three miles were difficult to identify accurately. From many angles, aircraft spotted in the distance appeared as indistinct dots, leading to frequent

---

[71] Airmen used the positions of a clock to call out sightings relative to the nose of their own aircraft. Twelve o'clock meant directly ahead, three o'clock was ninety degrees right of the nose and six o'clock meant directly behind. McCarthy, *Phantom Reflections*, 72, 79.

[72] Maj Robert E. Buhrow, interview by Lt Col Robert Eckert and Maj Harry Shallcross, September 28, 1967, 20, Air Force Historical Research Agency, Maxwell AFB, AL.

misidentifications. When G.I. Basel scanned the sky for the bandits reported fifteen miles from bullseye, he was gripped by fear when he spotted aircraft he thought were MiGs. "I looked back and saw four silver delta winged planes high and to the rear, MiGs sliding smoothly into the sun, getting in position to dive down and ventilate my body." He described his panicked physical reaction as "Hydraulic Lock!" But as he looked again, he saw more clearly that the aircraft "were white, not silver, and I saw the drooping tails of the F-4 Phantoms; our MIG cover. Our escort. Funny, ugly, droopy tails! I began to breathe again."[73] Ed Rasimus encountered the opposite and more dangerous situation when he mistook a formation of MiGs for his own flight of F-105s. Rasimus nursed a damaged aircraft across the coast of North Vietnam searching "frantically" for his flight, call sign Carbon. At the limits of perception, many crews saw what they wanted to see. "There, just to the right and a bit high. There they are. Three airplanes. It's Carbon." As he approached to rejoin his flight, "they turn in unison to the west, towards Haiphong. It's only then I can tell they aren't F-105s. They're MiG-21s, and I'm about to rejoin on the guys sent out to kill me." Although he felt a natural urge to attack, Rasimus chose "discretion over valor." He calculated the odds were against him because his Thud (which was not known for its dog fighting capability) was damaged and he lacked the support of his flight. "If I open fire on one of these guys I'll have grabbed the proverbial tiger by the tail," so Rasimus slipped away unseen.[74]

Up close, many aircrews found the appearance of MiGs startling, fascinating, or even beautiful. Al Lenski spotted a pair of MiG-17s approaching his flight from the side and was initially transfixed by his first MiG sighting. "I could not believe it! We were being engaged by some MiG-17s! I'd never seen a MiG for real, and at first I was fascinated to see my first MiG. It

---

[73] Basel, *Pak Six*, 26.

[74] Rasimus, *When Thunder Rolled*, 141.

looked just like the pictures we had seen for aircraft identification training. I remember seeing a star on their fuselage." Even though the MiGs began lining up for an attack on the flight ahead of Lenski, he had difficulty shaking his initial surprise: "I was still amazed at seeing MiGs. They really looked neat, I thought. Then the realization dawned on me that these MiGs were here to shoot at us. They were not putting on an air show but were deadly serious, with weapons, intent on shooting us down." Jolted from his reverie, Lenski maneuvered to counterattack the enemy aircraft, but as they detected his approach, they broke off and fled.[75] In a similar situation, G.I. Basel closed on a MiG lining up for an attack on the Thuds ahead of his own flight. He scored accurate hits with his cannon, but was fascinated by the sight of the stricken enemy aircraft. "I flashed past close by, my eyes wide with the nearness of this alien creature, beautiful in green battle dress, standing on its wing in a hard left break; flaming, and mortally wounded."[76]

Crews who spotted an approaching fighter before it opened fire could expect to survive the attack by turning tightly or jinking abruptly to spoil an enemy shot. The MiG-17 and MiG-21's cannons suffered in effectiveness because they featured a low rate of fire, poor accuracy due to low muzzle velocity and a poor gun sight, and a small ammunition supply. American pilots assessed their adversaries as poor shots as well; Robin Olds observed that MiG pilots improved steadily in early 1967, but "the one thing I think they lack, thank God, is ability to shoot. I have seen as many MIGs behind me shooting as I've seen in front of me being shot at."[77] Paul Lew Chesley survived multiple attacks by MiGs on the eventful Wild Weasel mission on April 19, 1967. Separated from the rest of the Kingfish flight as they fled from a MiG attack, Chesley and

---

[75] Lenski, *Magic 100*, 45.

[76] Basel, *Pak Six*, 87.

[77] Olds, interview, 3.

his pilot, George Dilojsi, evaded the gun attacks from eight MiG-17s with well-timed jinks. Although an F-105 could normally out-accelerate and escape from a MiG-17, Chesley and Dilojsi's afterburner failed on that mission and they had to endure repeated gun attacks. At first Chesley did not recognize the smoke from the MiG's cannon as gunfire: "I was expecting to see the twinkling of guns, as you see in World War II movies, the Spitfires, you know, twinkle, twinkle on the leading guy's wing." Instead, he saw "a large puff of gray black smoke came out of the bottom of the airplane, and I said, 'Now that's unusual,' and about a second and-a-half later, maybe two seconds, tracers started going by the airplane." Now understanding that smoke signaled gunfire, Chesley watched each MiG pilot, in turn, line up his attack through the F-105's rearview mirrors and called for Dilojsi to jink as he saw each MiG open fire. "I called the pilot, and I said 'the next time I tell you, the next time the guy makes a[n] attack on us, I will tell you to slip.'"[78] When smoke appeared under each MiG's nose (indicating gunfire), Chesley assessed "at that point, his bullets are committed, and we have a second and-a-half to move out" of the path of incoming rounds. The crew endured rounds of subsequent attacks and escaped them all and lived to tell about the day.[79] Such cool and well-timed reactions indicate a high degree of precise aircraft control and tremendous trust and partnership between Weasel crews.

Several MiG battles in spring 1967 resulted in confused melees that featured opposing groups of four to eight (or more) fighters turning at high speeds to gain a position of advantage. Turns at high speeds subjected the crews to high-G forces. Under high-Gs, pilots strained by grunting and tensing their legs and abdomens to force blood upward into the brain. Failure to do so resulted in a loss of vision, and under heavy Gs, unconsciousness. Coupled with the added

---

[78] A slip is an uncoordinated turn performed with opposite rudder and aileron.

[79] Paul Lew Chesley, interview by Moryma Aydelott, May 28, 2005, 1-3, Veterans History Project. Library of Congress.

strain of looking behind under typical loads of four to seven Gs, an extended dogfight could be physically exhausting. G.I. Basel turned hard to evade a MiG's attack and worked hard to keep the MiG in sight due to the G forces that pulled the blood from the eyes and brain. "I kept turning hard and he finally overshot. My neck was aching and my vision dimmed as I watched him sliding behind and to the outside of my turn." Basel fought to keep the enemy in sight. "I craned my neck, the G's pulling at my eyelids. Finally, I spotted him on the other side, turning away. I jammed left rudder and stick and whipped around to the left. The big Thud shuddered but kept turning."[80]

Gaining and maintaining sight of an enemy aircraft was essential. Failure to spot an attacking fighter put crews in grave danger. After the war, an Air Force study found that "81 percent of all U.S. losses occur[ed] when the crew was either completely unaware they were under attack, or found out too late to effectively defend."[81] In late 1967, the North Vietnamese began to exploit its MiG-21 force in high-speed hit and run attacks against aircraft in the rear of American formations to achieve tactical surprise. Under the direction of ground radar controllers, MiG-21 pilots swung widely around the flanks of American formations at high altitude and then turned in and accelerated in a dive to 700-800 knots (or 1.3 times the speed of sound) for an attack starting from beyond visual range, about five or six miles behind the Americans. The MiG pilots fired their AA-2 Atoll heat-seeking air-to-air missiles from two miles behind the rearmost American aircraft. The combination of the MiG-21's small visual profile, an attack with several hundred knots of overtake, and guided missiles gave American crews only a few seconds to visually detect and counter an attack. John J. Burns flew fighters in World War II, Korea and as

---

[80] Basel, *Pak Six*, 106.

[81] William Sayers, "The Red Baron Reports: What They Really Said," *Air Power History* 52, no. 3 (Fall 2005): 1-2.

the 8th TFW's Director of Operations at Ubon. He led F-4 missions at the rear of fighter strike formations and believed that without an early warning from the EC-121's radar, MiG-21s presented a major problem "because they could attack at sufficient speed that they could fire from beyond our visual range to see them from the rear. Only when somebody blew up from an Atoll hit did you know he was back there."[82] F-4 pilot Jon Black was very pessimistic about the high-speed MiG tactics. "The MiG-21s had been turning in behind the force, high, at six o'clock, supersonic, flying into the force, getting locked on firing missiles, coming off supersonic and turning north into China. And every time they did it, they were successful. Every time they launched a missile, they would hit somebody and down they would go."[83] Although MiGs were not as successful as Black's recollection, they found a viable tactic that was very difficult to counter through the end of the Rolling Thunder operations in Route Pack Five and Six in 1968. From January to October 1967, USAF fighter crews outscored their MiG pilot adversaries by shooting down 5.4 MiGs per USAF loss. From November to the end of Route Pack Six missions in February 1968, MiGs claimed nineteen Air Force jets for a loss of sixteen of their own; a ratio of .84 MiGs per USAF jet.[84]

American pilots loaded down with bombs and locked into unwieldy pod formations did not enjoy the sensation of being the objective of North Vietnam's fighter pilots, who stalked the American formations by maneuvering just beyond visual range to swoop in to attack from the vulnerable flanks and rear. As Mike McCarthy "skidded and yawed" his F-4 searching for yet

---

[82] Lt Gen John J. Burns, interview by Hugh N. Ahmann, January 5, 1984, 240, Air Force Historical Research Agency, Maxwell AFB, AL.

[83] Black, interview, 14-15.

[84] Between January and October 1967, USAF crews engaged MiGs 244 times resulting in eighty-six MiG kills vs. sixteen USAF losses. In contrast from November to March 1968, 108 engagements led to sixteen MiG kills at the cost of ninteen USAF fighters. Overton, *Rolling Thunder January 1967 - November 1968*, 24, Figure 6.

unseen MiGs, he did not savor the experience because "we were the ones they were after." McCarthy had flown more freely-flowing combat air patrol missions where he sought out MiGs in a lightly-loaded F-4 primed and ready for air combat. To McCarthy, the experience was more appealing than carrying bombs in the strike role where "I had experienced what it is to be the hunted rather than the hunter." To be stalked by another pilot inserted the humanity buried underneath the technology of air combat. "While I had tended to look at the MiG in my first engagement as simply a target, or a technical problem to be solved, I now understood what it felt like to be at the other end of the spear. It changes your perspective." During periods of high MiG activity, F-4s assumed an escort role and exchanged their bomb loads for air-to-air missiles and cannons (slung beneath the aircraft's belly in an external pod) to optimize their maneuverability and weapons load for shooting down MiGs. Although senior commanders did not want to swap bomb-carrying fighters for air-to-air escorts (because they lessened the bombing airmen that believed would help win the war), the crews loved it. McCarthy envied the escort pilots. MiG escorts did not have to face flak during the bomb run, but more importantly, "it also meant that they might get a chance to shoot down one of the North Vietnamese MiGs, which further increased the mission's desirability. Ah, glory!"[85]

Unlike encounters with SAMs or guns, competent fighter crews who were confident in the power of their large capable U.S. fighters, their control of that power, and the freedom to use it as needed in the air made them yearn for the opportunity to engage an enemy fighter. Pilots who defeated a SAM lived to fly another day, while those who defeated a MiG were able to test themselves against another fighter pilot and earned praise and renown from their peers. Jerry Cook's F-4 squadron predominantly flew close air support and interdiction missions from Cam

---

[85] McCarthy, *Phantom Reflections*, 72-3.

Rahn Bay Airbase, South Vietnam, but Seventh Air Force ordered his unit to fly over North Vietnam when MiG activity picked up in 1966. "I was really elated at the news" about the new mission "because we were going to start getting some MIG CAP escort missions into the North." Despite the increased risks, Cook "was glad to be in 'MiG country'" and passed up two opportunities to take leave in order "to go hunting [because] I wanted a MiG."[86] The ultimate achievement as a fighter pilot was to score five aerial victories, which earned him the coveted title of "ace." Mike McCarthy, got a shot at his longed-for "glory." As he approached a MiG, his back-seater locked onto it with their radar. McCarthy thought "glory was about to come my way, and I would be the envy of all my peers!" But he was denied the opportunity when the MiG turned and ran away outside the range of McCarthy's missiles. "I can still recall the searing disappointment I felt at that instant. The intoxicating thrill of the hunter about to down his quarry had ended as quickly as it began."[87]

Those who gained an opportunity to close with a MiG adversary experienced frustration with the USAF's early missile armaments. The radar-guided AIM-7 Sparrow missiles provided a long-range weapon for the Phantom while infrared-guided AIM-9 Sidewinders provided a closer-range capability for the F-4 and F-105. The F-4 could carry four twelve-foot-long 445-pound Sparrows and four nine-foot-long 164-pound Sidewinders that provided weapons lethal out to a dozen miles (two miles for the Sidewinder) but pilots could not fire either missile at long range throughout most of the war without first visually identifying their target as an enemy aircraft.[88] Jerry Cook noted the dilemma: "when our missile-only aircraft had gotten close enough to

---

[86] Jerry W. Cook, *Once A Fighter Pilot* (McGraw-Hill Professional, 2002), 192, 208, 211.

[87] McCarthy, *Phantom Reflections*, 68-69.

[88] Heffron, *Air-to-Air Encounters Over North Vietnam, 1 January - 30 June 1967*, 68.

accomplish the identification, they were usually too close to fire a missile."[89] When fired, the missiles far underperformed peacetime expectations in accuracy and reliability. Jon Black's flight leader fired three of his four Sparrows without any apparent success. Black's wing commander, Robin Olds fired several guided missiles to achieve a single kill. On May 2, 1967, Olds was escorting an F-105 mission and locked onto a MiG-21 attempting to attack the Thuds. I "kept the pipper on the MIG, and fired two AIM-7's in a ripple. One AIM-7 went ballistic. The other guided but passed behind the MIG and did not detonate." Olds then moved in closer to the violently maneuvering MiG for an AIM-9 shot. "I snapped two AIM-9's at the MIG and did not observe either missile." Both, evidently failed. Olds managed to stay behind the gyrating MiG and when the MiG pilot reversed his turn, Olds locked on his third AIM-9. "From the moment of launch, it was obvious that the missile was locked on. It guided straight for the MIG and exploded about 5-10 feet beneath his tailpipe."[90] Olds achieved one hit in five missile attempts, for a 20 percent hit rate. His percentage was better than the average rate achieved by all Air Force pilots in the spring and summer of 1967; between April 23 and July 8, the AIM-7 hit rate was only 11 percent, the AIM-9 rate was 17 percent. Missiles achieved only eighteen known hits in 131 firing attempts, creating understandable frustration among fighter crews.[91]

Crews felt more confident in the short-range, but accurate six-barreled Gatling Gun. The F-105's internal cannon featured a thousand-round magazine that enabled a long ten second burst of fire. Like most aircraft of that generation, the pilot had to throw several switches to change a gun sight set up for bombing to the air-to-air gunnery mode. Since most MiG encounters were

---

[89] Cook, *Once A Fighter Pilot*, 20.

[90] Futrell et al., *Aces & Aerial Victories*, 52.

[91] Heffron, *Air-to-Air Encounters Over North Vietnam, 1 January - 30 June 1967*, 69.

fleeting opportunities, F-105 pilots achieved several MiG kills without a sight by getting close and filling their windscreen with the enemy aircraft. The F-4 pilots yearned for a reliable air-to-air weapon, and in May 1967, the 366th TFW at Danang hung an externally-mounted twenty millimeter gun pod on their aircraft. Scoring the F-4's first kill with a cannon, James Hargrove sprung a lethal surprise on his aerial adversary when he opened fire far inside the Sidewinder's minimum range of 3,000 feet: "I opened fire at approximately 2,000 feet from the MIG and continued firing until, at approximately 300 feet, flame erupted from the top of the MIG fuselage. Almost immediately thereafter the MIG exploded." Hargrove had to make an immediate turn to avoid the fire and debris from such a close range shot. "I broke left to avoid debris, then reversed to the right and saw the MIG, in two sections, falling vertically toward the ground."[92] Pilots rejoiced in the gun's reliability; between April and July, Air Force pilots scored fourteen kills in twenty-eight attempts for a 50 percent hit rate with the cannon. John Burns noted "the gun is the only thing that can't be countered. If you stick a gun in a man's ear and fire it, he can't turn on a jammer, he can't turn on a flare, he can't do anything."[93] William Kirk was even more enthusiastic about the gun pod and remarked, "I think it's the finest thing that was ever invented."[94]

Regardless of any material limitations, experienced American fighter pilots felt confident in their abilities and aircraft to win in the air. The ability to prevail against a MiG depended on training and equipment, but F-4 pilot Bob Titus was so confident in the training of American fighter pilots that he exclaimed to an Air Force analyst "if we were flying MIG-17s and MIG-21s,

---

[92] Futrell et al., *Aces & Aerial Victories*, 55.

[93] Buhrow, interview, 183.

[94] Maj William Kirk, interview by unknown, 1968, 6-7, Air Force Historical Research Agency, Maxwell AFB, AL.

and they were coming up there in F-4s and F-105s, I think we would still have the highest score."[95] Titus flew against MiGs over Korea and over North Vietnam. Other career fighter pilots like Mike McCarthy and Jerry Cook had many practice air-to-air engagements under their belts and felt well prepared and confident in their ability to prevail in any encounters with MiGs. William Kirk, an experienced Ubon F-4 pilot (and MiG killer), saw air-to-air combat as the most fluid type of combat due to the wide range of circumstances and contingencies when two or more aircraft encounter each other in the air: "it's impossible to sit down and say in a briefing room what I'm going to do if I see a MIG. I've got to wait and see what he's going to do and then I've got all of these options that I can use." Kirk's options were the result of intense study and reflection informed by scores of practice engagements. Within Kirk's unit at Ubon, Robin Olds set the standard of thinking through tactics which entailed "a lot of hard skull work, a lot of chalk talk, a lot of plotting and planning and thinking" to optimize the wing's fight against the MiGs.[96] As an experienced air-to-air pilot, Kirk saw every engagement as a learning opportunity. Kirk thought through options for air-to-air engagements, but refined them continuously. "But these are the things that you continually work on. And I'm sure that the next time we see the MiGs they'll have something else and we'll try another method."[97]

Non-fighter pilots cross trained into fighters, however, were hobbled by a lack of long-term experience and conservative and limited training syllabi. Even though combat veterans conducted much of the basic fighter training in the States, it was limited by a fast-paced training pipeline that had to produce lots of pilots quickly. Because training units became stretched to the

---

[95] Heffron, *Air-to-Air Encounters Over North Vietnam, 1 January - 30 June 1967*, 15.

[96] Olds, interview, 28.

[97] Kirk, interview, 18.

limit, safety consciousness sacrificed realistic training to preserve training assets. Robert Belli flew two tours in F-105s after years of flying interceptors in Air Defense Command and believed air-to-air experience was essential: "I think you are going to get a lot of people killed by taking a fellow that doesn't have any training and expertise in air-to-air and put him against a MiG or another airplane."[98] Jon Black trained into fighters from instructor duties in Air Training Command and was overwhelmed in his first encounter with MiGs over Haiphong Harbor in 1967. His flight of four F-4s had a head-on pass with MiGs, during which Black watched his flight leader fire a brace of missiles that missed their intended target. "I was hanging on, and all of a sudden, I heard the back-seater say, 'We are locked on.' I said, 'We are locked on to what?' He said, 'MiGs, damn it.'" Black did not fire his missiles: "I was in such a position, if I had launched my missiles they would have gone right by lead's canopy, so I didn't think he would appreciate that. I held it off and thought, 'I'll save them for something else here.'" The encounter then turned into a confused chase with neither side scoring a victory. As they turned from the initial shots, Black saw that "two MiG-17s went right underneath and behind us, and we thought, 'Oh, no.' It scared me to death. We turned and got on their tail, but they were just outside of missile range." Unlike the language of control, Black's description is one of confused reactions and lack of anticipation. He had poor coordination between himself and his back-seater evident in the confusion over who they had locked the radar onto. Black did not maneuver his aircraft into a position he could fire from without jeopardizing his leader, and was frightened by the appearance of additional MiGs.[99]

---

[98] Lt Col Robert E. Belli, interview by Maj Lyn R. Officer and Hugh N. Ahmann, January 29, 1973, 84, Air Force Historical Research Agency, Maxwell AFB, AL.

[99] Black, interview, 15-16.

North Vietnam's combination of guns, missiles, and MiGs created an interlocking system of lethal dangers that challenged American crews throughout the Rolling Thunder campaign. Considered separately, each system posed unique challenges to the fighter crews. Antiaircraft guns mandated high altitude ingress, egress, and attacks that sacrificed some mission effectiveness for survivability. Surface-to-air missiles called for technological innovations and tactics that deprived some the strike pilots of their agency and flexibility, but enhanced those qualities for those who flew as Wild Weasels. Rigid jamming pod formations maximized jamming protection but forced fighter pilots to surrender their traditional reliance on freedom to maneuver in tactics that were not far from the long-resented bomber formations. For the Wild Weasel crews, technology enabled them to creatively hunt surface-to-air batteries, elevating their freedom and autonomy; a payoff that seemed to compensate the pilots and electronic warfare officers for the increased danger they faced by dueling with SAM sites. The MiGs forced a diversion of part of the fighter force into an air-to-air escort role that allowed escort crews to break away from the strike force in free-wheeling dogfights, and appealed to their desire for glory and the ultimate test of an aerial battle against an enemy fighter pilot. The magnitude of the threats posed by the entire system of air defenses combined with operational mishaps to inflict punishing losses on Air Force fighter units. Korat's 469th Tactical Fighter Squadron was hit the hardest of all Rolling Thunder's fighter squadrons; it lost 305 percent of its initially authorized strength of eighteen F-105s. Takhli's 354th Tactical Fighter Squadron was hit nearly as hard, and lost 283 percent of its initial strength during the campaign.[100] The losses were amplified in the

[100] Of Rolling Thunder's F-4 squadrons, Danang's 480th Tactical Fighter Squadron sustained 161 percent losses and Ubon's 497th Tactical Fighter Squadron sustained 144 percent (although squadron strengths varied, these figures reflect all known inflight losses and assume an average strength of eighteen aircraft). Hobson, *Vietnam Air Losses*, 15-166.

minds of the crews who felt they lacked the degree of control they needed maximize the impact of their missions and to minimize losses.

By mid-1967, the threats had intensified to the point that Col Olds, the 8th TFW wing commander allowed only his most experienced crews to fly into Route Pack Six. "I got all the guys together at one point in the summer of 1967, and I said, 'Troops, I am going to revert back to high school days. I am going to form myself a first team. It is the first team that is going to Route 6.'" Despite the lethal consequences of flight into Route Pack Six, Olds challenged his pilots to aspire to fly the toughest missions because he would only take his best. "I want everyone to be on the first team. You have to work hard at it, all of you…. I am going to need the best guys. I can't sit up there and worry about number 2 or number 4, or a green 16. I cannot do it." Despite the mortal dangers, Olds found that "I did not lack for volunteers, and the guys that did not go, flew their share of tough missions."[101] Why Olds had no lack of volunteers is the subject of the next chapter.

[101] Olds, interview, 23.

Chapter 5: Motivation in Rolling Thunder

American newspapers dutifully recorded a steady toll of American planes and pilots throughout Rolling Thunder. Headlines like this May 2, 1965 New York Times article "2 MORE U.S. PLANES DOWNED IN NORTH; TOTAL NOW IS 225" occupied prime front page coverage "above the fold" well into 1967.[1] The routine reports of aircraft losses failed to deter thousands of young American males seeking opportunities to fly military aircraft. The motivation that led them to a military cockpit was covered in the Chapter Two and will be briefly reviewed before turning to the challenges posed to motivation during Rolling Thunder. The desire to fly propelled these aviators into fighter cockpits, and the combined interactions of the Air Force personnel system and individual assignment requests worked to eventually place them into cockpits in Southeast Asia. This chapter describes the challenges to an aviator's motivation posed by exposure to the unfamiliar sights and sounds of battle, fear, and combat losses. Grinding losses eroded the will to climb back into a fighter cockpit after experiencing them firsthand and then return to combat—at least ninety-nine more times over North Vietnam for those fortunate enough to survive a full tour without being killed or captured.

The will to overcome fear and return to the deadly skies over North Vietnam was founded on a durable and persistent desire to fly. American airmen felt a basic level of patriotism

---

[1] Aircraft losses remained news-worthy throughout the war, although as the air war continued into its third and fourth years, coverage of U.S. aircraft losses moved from the front page. The thousandth aircraft lost warranted page three coverage in the *New York Times*. "2 MORE U.S. PLANES DOWNED IN NORTH; TOTAL NOW IS 225," *New York Times* (Saigon, May 2, 1966), 1; Tom Buckley, "U.S. Plane Losses in Vietnam Pass 1,000 as 5 Are Downed," *New York Times* (Saigon, January 6, 1968), 3.

and believed that Rolling Thunder was an appropriate (but inexpertly directed) way to fight the war, but their strongest and most universal motivation sprang from their passion for flying. From that internal yearning, they experienced freedom and excitement, they derived satisfaction from the ability to exert control over themselves and their aircraft, and they felt an obligation to use their powerful aircraft to accomplish their missions and to support each other. By expertly controlling their aircraft, and using the power under their control to fulfill their duty, airmen came to live up to their idealized self-images and to earn the respect and recognition of their peers.

During the thirty-two months of Rolling Thunder, the two F-105 wings lost approximately three hundred F-105s, which totaled 235 percent of their average strength.[2] Despite the losses reported in daily U.S. newspapers, airmen continued to fly over the North, and students at undergraduate pilot training continued to eagerly volunteer for F-105 and F-4 assignments throughout the campaign. These pilot's' initial motivation usually included the desire to fly the best and most powerful airplane possible, which meant fighters. By late 1965, growing cadres of flight instructors back from combat tours in Southeast Asia told trainees how it would be in combat, but at the same time ingrained willful denial and self-reliance, embodied by the idealized fighter pilot of the movies: calm, courageous, and in total control. This attitude was exemplified by Jon Black's instructors who told him the right answer to the situational quiz was to roll in on a dangerous target even though his leaders had been hit: 'I'm going to roll in because

---

[2] There are many counting conventions for tallying losses over Vietnam, many of which do not extend across all of Rolling Thunder. These figures are extracted from Chris Hobson's book on the subject, which provides the most comprehensive look at U.S. losses. Hobson's work includes aircraft lost in the air and destroyed on the ground, but the figures cited here include only aerial losses. It is very likely that numerous aircraft sustained damage inflight, made successful landings and were scrapped. These instances are not recorded by Hobson and not included in this account. Average F-105 strength as reported in Thompson's official history of the campaign was 126 in 1966 and 129 in 1967. Hobson, *Vietnam Air Losses*, 15-166; Thompson, *To Hanoi and Back*, 308.

they aren't going to hit me. I'm a fighter pilot.'"[3] Although trainees heard of the dangers first hand from men who had been there, the realities of battle were still distant and abstract concepts for student pilots with their hands full learning to fly. Furthermore since their mentors had made it, most likely surmised they would make it too if they learned and flew well enough. Successfully asserting control over their aircraft and fears in UPT and fighter training generated the copious self-confidence that enabled these young tigers to believe that they could achieve anything and the headlines could not pertain to them. Delighted by an assignment to F-105s after a year at staff college, Al Lenski reminisced "at that time the bad publicity was not a factor for me."[4]

Fear: "It's a Real Lie if Anybody Said They Weren't Scared"

Despite the high degree of self-confidence these men felt as they completed training, aviators bound for Southeast Asia experienced gradually increasing levels of apprehension as they neared the great unknowns of combat a half-world from home. Ken Bell tried to encourage a young lieutenant, who came to him gripped by fear as they prepared to leave fighter training for Thailand; Ed Rasimus felt a growing sense of dread as he rode on an airliner across the vast Pacific Ocean, and by the time he reached a stop in the Philippines, "I went through cycles ranging from fear to panic to cowardice to fatalism."[5] The reality of combat losses confronted many when they checked into the squadron because they were assigned the quarters of a former

---

[3] Black, interview, 78-79.

[4] Lenski, *Magic 100*, 14.

[5] Bell, *100 Missions North*, 15; Rasimus, *When Thunder Rolled*, 29.

squadron-member who did not make it back.[6] When the veteran F-4 "wimps" warned Lt Ron Bliss about F-105 losses, he did not appreciate the reality of their comments until he saw for himself the next day. Bliss and his F-105 classmate Lt Tom McNish rode in the back of a C-130 transport to their assignment at Takhli. "They dropped the tailgate for us to get out. The first thing we saw was a three-plane missing man formation turning into an initial up there….I looked up; I looked down at McNish, and right after that here came a second flight of three missing one." Confronted by the reality of two flights returning with 25 percent losses, Bliss could only croak: "'Whoa, welcome to Takhli.' So this was it."[7]

Anxiety seemed to peak for many pilots just before a flight. Only a few weeks after trying to bolster the courage of the young lieutenant at fighter training, Ken Bell was stricken with anxiety the night before his second combat mission. "For the first time in my life I recognized that I was staring at genuine fear, fear that had hit me as I read my name on the schedule unexpectedly and had turned my jubilation [from successfully completing his first combat mission] into anxiety."[8] Several pilots recall their peers trying to discretely slip into the latrine to vomit before a mission due to mounting anxiety. Such fear was understandable, because fighter crews believed they had to face what one F-105 pilot described as "the most heavily defended place in the history of aerial warfare" in Route Pack Six.[9]

---

[6] When Lt Ed Rasimus arrived at Takhli, he was told that he "would get a room in the C flight hootch in a day or two, as soon as the personal effects of one of the lost pilots could be inventoried, packed and shipped." Rasimus, *When Thunder Rolled*, 41.

[7] Bliss, interview, 34.

[8] Bell, *100 Missions North*, 81.

[9] The unidentified pilot added "I don't know how true it is…but I've been there and I believe it." *There Is a Way* (1352nd Photo Group, USAF Aerospace Audio Visual Service, 1967).

The time between combat flights provided the strongest urge and best opportunity for men to avoid combat because the momentum of a mission and the mental focus needed to fly carried men along once underway. Once an airman reached his aircraft, he began to focus on the very demanding tasks needed to fly a fighter. As a mission progressed from preflight checks to engine start, to takeoff, to refueling, and then to entering North Vietnamese airspace, a mission's momentum increased and legitimate reasons to return greatly decreased. Formations from two or three bases moved relentlessly at eight to nine miles per minute (since aircraft cannot be stopped in the air), and a collective presence created considerable pressure to press forward.[10] Unlike an infantryman who might try to duck combat by slipping out of sight in a chaotic battlefield, there was no way for the pilot of a 65 foot long fighter to drop from formation unnoticed. But on the ground (and away from the aircraft parking ramp) the fears that might cause pilots to avoid combat were strongly felt and were joined by the opportunity to act on that urge. Temporary medical groundings for a cold or aircraft aborts for maintenance difficulties were legitimate reasons to avoid combat, but raised suspicions if they occurred before a dangerous mission or recurred. Three responses to an Air University survey of F-105 pilots on fear asserted that officers who did not like to fly avoided combat by "aborting for minor problems, maintenance aborts, 'other pressing duties'" and sickness.[11] To avoid suspicions, or simply to fulfill one's combat

---

[10] Robert Belli thought momentum led to some bad decisions. "Many times people that were less experienced or who didn't use good judgment would fly missions where the weather was terrible because they didn't want to have to abort the whole thing." Belli, interview, 67.

[11] Unfortunately, Maj Grady only included the write-in answers to three of his 173 surveys in the report. Maj Walter Anthony Grady, "The Moral Domain of War: A View from the Cockpit" (Air University, Maxwell AFB, AL, May 1993), Appendix A, School of Advanced Airpower Studies.

duty, there was a strong incentive to avoid grounding and fly with a cold, or to press on despite aircraft malfunctions.[12]

Some flyers approached their flight or squadron commanders with their fears of combat, seeking relief from hazardous duty. The Air Force lacked formal guidance on how to handle such cases, so commanders were on their own to determine the best course of action.[13] Commanding officers' responses ranged from rest and counseling, shuttling pilots to other non-flying duties, or formal administrative actions seeking to permanently ground pilots or a court martial. Squadron commander William Norris elected to threaten one pilot who claimed he could no longer fly to Route Pack Six. He told the pilot "before you sit down and tell me that, go back outside, sit down and have a cup of coffee, think about it, because if you come in and tell me that again, I'm going to have you court-martialed." In addition to the coercive threat of a court martial, Norris appealed to the officer's self-image as an F-105 pilot (invoking the fighter pilot ideal) and his sense of fairness to the other pilots in the unit: "By fate you are a -105 pilot, and nobody wants to go to [Route Pack] 6-Alpha. Nobody wants to go there, but if I let you get away with it, I can't look the rest of these guys in the eye. You are going to 6-Alpha or you are going to be court-martialed with dereliction of duty." After some rest and support from the chaplain, Norris reported that the officer honorably completed all one hundred missions.[14] When a young F-105 pilot asked Robert

---

[12] Pilots often tried to conceal grounding maintenance or health issues. Ed Rasimus recalled flying a sortie to Route Pack Six without a bombsight. Many pilots especially avoided flight surgeons to avoid grounding. Flight surgeons, more than anyone else, held the power to keep pilots from flying—the activity that they loved the most. Dean Hunter recalled flying with a cold and rupturing a sinus cavity out of a fear of grounding. G. I. Basel helped a fellow pilot treat a neck injury. "He was always afraid the flight surgeon would find out and he'd be grounded." Hunter, *For Love of Life and Country*, 89; Basel, *Pak Six*, 5; Rasimus, *When Thunder Rolled*, 235.

[13] Maj Phillip T. Hamilton, "Fear and Loathing in the Air: Combat Fear and Stress in the Air Force" (Air University, Maxwell AFB, AL, June 2005), 30-35, School of Advanced Air and Space Studies.

[14] Norris, interview, 9.

Smith to take him off combat duty, Smith offered him a way out, but at the cost of his wings and career. "He would throw up before each mission and was truly panicked by the threat, but was doing the job." Smith offered to "take steps to get him off flying" but he also assured him that he would be "dismissed from the service, if that was what he chose." Smith also effectively appealed to his sense of personal honor and masculinity. "I told him: 'You're a young man with a long life ahead. Think about what I am saying and come back tomorrow with your decision. You have yourself and your wife, and some day children. If you quit now you will look into the mirror every morning when you shave and know for the rest of your life that you are looking at the face of a coward! It's the same face they will look at. That decision will determine what it is you really can't stand." The officer elected to continue flying and displayed "real courage" in Smith's eyes because he felt so much fear and successfully confronted it.[15]

Such combat refusals and requests to be relieved from combat duty were rare during Rolling Thunder. Unfortunately there is little to no statistical evidence within known Air Force archives, so anecdotal evidence must suffice.[16] When asked about the subject in oral history interviews, line pilots, squadron commanders, and senior wing leaders recall one to two instances per combat tour per wing of one hundred or more pilots for F-105 wings (up to two hundred pilots in the two-seat F-4 wings). Col F.C. "Boots" Blesse served as the 366th TFW director of operations for a year starting in April 1967 and recalled "we did have a couple of guys who did not want to fly, so we processed them out and sent them back to the States without wings. Now,

---

[15] Smith, "Robert W. Smith Autobiography," 193.

[16] Maj Phillip Hamilton combed the Air Force archives for statistical evidence of acute fear affecting aircrew in Southeast Asia for his thesis at the School of Advance Air and Space Studies in 2005. He wrote "one of the most interesting aspects of research on this period is the shortage of historical and statistical data about the subject….There are no policy letters and only a few messages and medical studies to review. Official histories, where available, do not mention the subject." Hamilton, "Fear and Loathing in the Air: Combat Fear and Stress in the Air Force," 31.

those people should have been detected in the training program but they were not."[17] F-4 pilot Philip Fisher voiced a common sentiment. "I think I served with the best. We only had one person there in '65, for some reason he developed a fear of flying, so we sent him home….but other than that, I only served with good people."[18]

Others, who had the greatest difficulty mustering the courage or focus for battle needed to fly well in combat were shunted aside. Wing and squadron commanders dispatched the aviators who had difficulties to wing staff positions that involved fewer flying responsibilities, while wings sent those who were the poorest matches in courage and ability to the Seventh Air Force staff in Saigon. EWO James Hendrickson arrived in theater three months after the end of Rolling Thunder and observed that "the guys that got sent to 7th Air Force were the guys that couldn't hack it in the squadron; the ones who couldn't fly or the ones that exhibited poor judgment." On the other hand, he noted that "The guys that could hack the program that were good pilots, were good bombers, were good air-to-air people, they wanted to keep in the unit." It should come as no surprise that with this kind of levy, the wings complained about the quality of the planning done in Saigon. Hendrickson lamented that "7th Air Force, as a general statement, did more to screw us up than they did to help us."[19] When Howard "Scrappy" Johnson, the 355th TFW director of operations received a levy for five pilots for reassignment to Seventh Air Force headquarters, he was already considering how to deal with a lieutenant colonel suspected of

---

[17] Blesse, interview, 35.

[18] Philip Richard Fisher, interview by Sandra Mit-Chelle, May 28, 2005, Veterans History Project. Library of Congress.

[19] Hendrickson, interview, 95.

cowardice for refusing to fly. Johnson's wing commander suggested "getting rid of the problem by simply putting the guy on the list," which Johnson did.[20]

The Will to Fight: "Apparently, All of Them Wanted to Fly"

The great majority of Air Force aviators like Bell, Bliss, and Rasimus, performed well under stress, motivated foremost by an intense desire to fly, which was framed by a belief in the purpose of the campaign, and a backdrop of patriotism. From their internal yearning to fly, airmen experienced freedom and excitement in combat over North Vietnam, derived satisfaction from the ability to exert control over themselves and their aircraft, and felt an obligation to use their powerful aircraft to accomplish their missions against North Vietnam, but also to support each other. By expertly controlling their aircraft, and applying the power under their control to fulfill their obligations, airmen strived to live up to their idealized self-images and to earn the respect and recognition of their peers.

Airmen believed that their missions to bomb North Vietnam were justified as noted in Chapter Three, and that the bombing contributed to the larger, necessary struggle against communism. After the war, William Ricks asserted "I always thought Rolling Thunder was a good idea. It should have worked. It didn't work because of flawed execution and flawed direction at the highest levels."[21] Even as public sentiment mounted against the bombing late in the campaign, many airmen continued to believe that the campaign and its underlying strategy were correct and appropriate. William Norris acknowledged that in spite of the hard knocks

---

[20] Johnson related that "later I really regretted it. I should have told Swede [his squadron commander] to put the son of a bitch up for a Package Six mission with me on his wing and if he had aborted then, I'd have damn well court-martialed his ass." Howard C. Johnson and Ian A. O'Connor, *Scrappy: Memoir of a U.S. Fighter Pilot in Korea and Vietnam* (Jefferson, NC: McFarland, 2007), 220.

[21] Ricks, interview, 18.

suffered by airmen late in the campaign, Rolling Thunder was on track. "At the end of 1967, which was the worst year of all for the Air Force up there, most of the prisoners were taken then, most of the airplanes were shot down, but even [after] all this, at the end of 1967 they [the North Vietnamese] were really on their ass up there. The northeast railroad, the supplies of China, the power units, the power plants, everything was down."[22] After years of tight limitations on the bombing, Norris could see meaningful results from his pilot's actions which added to his motivation.

Airmen also believed in the domino theory, which likened the spread of communism to a line of falling dominoes if allowed to progress without opposition. Airmen generally accepted this theory and saw Vietnam and Rolling Thunder as a necessary fight that was part of the bigger ideological struggle between the communist bloc and the free world. Ubon pilot Jon Black voiced a common refrain "I believed everything: my country right or wrong, communism was bad, [and] if we didn't fight there we would have to fight here.[23] Many others attributed a justified and necessary defensive purpose to the war. F-105 EWO Jay Jensen saw a need to stop the spread of communism, but also saw a necessity to save millions of South Vietnamese and "help them gain/defend their freedom."[24] Rolling Thunder's crews remained committed to these beliefs despite many contrary opinions expressed by family and friends back home. Although Sam Johnson's in-laws discouraged him from volunteering for Vietnam (arguing "it's a lousy war Sam"), he recalled feeling a deep sense of patriotism from growing up during World War II that

---

[22] Maj Gen William C. Norris, interview by Hugh N. Ahmann, November 29, 1984, 4, Air Force Historical Research Agency, Maxwell AFB, AL.

[23] Black recalled his beliefs with a note of bitterness. He was shot down during Rolling Thunder and later became deeply embittered by his POW experience. The North Vietnamese selected him for an early release and Black was ostracized by his fellow POWs for accepting a release against orders from the POW chain of command. Black, interview, 8.

[24] Jensen, *Six Years in Hell*, 25.

pushed him forward. But to Johnson and his peers, the cause behind the war wasn't his most powerful motivator. He believed that "for most pilots the passion of patriotism pales a little next to the fervor of our competitive ego-driven self."[25] The ideological clash between democracy and communism, the domino theory, and simple patriotism provided a basic, but peripheral motivation that gave them a good reason to fly in combat.

A passion for flying provided the core motivation that propelled Johnson and many others into combat. This desire provided a basis for their willingness to return to combat despite the known dangers. Johnson loved the sensations and challenges of flying a fighter, and anticipating combat in Vietnam he mused that he "could already feel the adrenaline that surged through a pilot's system as the afterburner lights."[26] Fellow Ubon F-4 pilot Robert Buhrow recalled a period of time when the personnel system got ahead of Ubon's needs for pilots and the unit was temporarily over manned. Instead of enjoying a respite from the hectic pace of flying operations, the pilots became restive. "They'd get unhappy if they weren't flying at least every other day. Apparently, all of them wanted to fly once a day." Lacking combat opportunities, "back-seaters would go out and volunteer to fly test hops just to get to fly, and we had front-seaters standing in line to get on test orders, because that meant the days they weren't flying missions they'd go fly."[27]

Aviators relished the freedom of flight, and the excitement they felt in experiencing it, although they did not have much ability to savor that freedom until clear of North Vietnam's heavily defended airspace (as already noted in Chapter Three). The freedom experienced in flight

---

[25] Johnson, *Captive Warriors*, 144.

[26] Ibid.

[27] Buhrow, interview, 43; Lt Col William S. Van Gilder, interview by 1Lt G. Harrison, June 20, 1968, 47-48, Air Force Historical Research Agency, Maxwell AFB, AL.

was arguably the foremost of the rewards of military flying, but most taken for granted. The value airmen placed on that freedom was perhaps articulated best by those who were deprived of it. Thud pilot Larry Guarino was shot down and captured in 1965. Deprived of the ability to fly, he relived memories of flying in World War II to escape the realities of his seven and a half year captivity: "the dreaming lifted me out of there and back to freedom, and flying, and white puffy clouds—far, far away from Hanoi."[28] One of Guarino's fellow prisoners, Navy Lt Gerald Coffee observed a formation of F-105s over Hanoi from his cell. One of the aircraft was damaged and struggled to clear enemy airspace. This incident provided the inspiration for a toast titled "One More Roll" that Coffee composed and taught to his fellow prisoners. The toast rejoices in the freedom of flight and the pain of its loss:

> *We toast our faithful comrades, now fallen from the sky,*
> *And gently caught by God's own hand, to be with him on high,*
> *To dwell among the soaring clouds they knew so well before,*
> *From dawn patrol and victory roll, at heaven's very door*
> *And as we fly among them there, we're sure to hear their plea,*
> *'Take care my friend; watch your six, and do one more roll…just for me.'*

As Coffee and the other aviators incarcerated in Hanoi lamented their loss of freedom, they struggled to control their behavior and avoid cooperating with their captors, despite torture, to preserve their honor. Another popular poem shared among American prisoners of war reinforced the degree of self-control exercised by these men who appeared to be in control of very little. F-105 EWO Jay Jensen learned "Invictus" from his fellow prisoners (the last verse excerpted here) which "strengthened me greatly."

> *It matters not how strait the gate,*
> *How charged with punishments the scroll,*
> *I am the master of my fate;*

---

[28] Larry Guarino, *A POW's Story: 2801 Days in Hanoi* (New York: Ivy Books, 1990), 226.

I am the captain of my soul.[29]

For Coffee and Jensen's peers, who were still flying over Hanoi, control of one's self and one's aircraft became essential to overcoming fear and performing well in combat. Feeling "in control" of a dangerous and complex situation was incredibly difficult but intensely rewarding. Flying an aircraft precisely, maintaining formation, being concise on the radio, and bombing accurately were all outward indications of precise and skillful flying, but these outward signs were founded on high levels of mental self-control and focus that enabled aviators to prioritize countless flying tasks. Newcomers to the theater had a daunting challenge to recapture that elusive and rewarding sense of control (to "get back up to speed"—physically and mentally—in aviator's lexicon) because most had not flown for weeks while on leave, attending jungle survival school in the Philippines, and getting settled at their new base.

An individual's first few combat missions could be overwhelming because the surroundings were unfamiliar and dangerous. Although the fighter cockpit was a familiar and comfortable environment, the challenge was to process all the new and unfamiliar information originating outside the cockpit and exert one's control over the situation, and then regain an aviator's normal high degree of self-confidence. The landmarks and navigation checkpoints that would later serve to orient crews to the political map, enemy threats, and safe areas were all new and unfamiliar. Ken Bell recounted that on his first combat mission "I was concentrating so hard on flying formation that I was oblivious to the fact that we were over enemy territory and I was about to drop bombs on a target in North Vietnam for the first time."[30] Radio frequencies, call signs, and radio terminology were all new to a pilot fresh in the theater. The first sight of enemy

---

[29] Gerald Coffee, *Beyond Survival: Building on the Hard Times--a POW's Inspiring Story* (New York: Putnam, 1990), 287; Jensen, *Six Years in Hell*, xii.

[30] Bell, *100 Missions North*, 73.

defenses, from the puffs of smoke from antiaircraft fire or the smoke and flame from the launch of a surface-to-air missile were unfamiliar, frightening, and might not even be understood to be a threat. F-4 Phantom pilot Mike McCarthy recalled on his first mission mistaking flak bursts for cumulus clouds: "I don't remember all those small cumulus clouds being there when I rolled in. Maybe I was concentrating too hard on finding the target." McCarthy was jolted from ignorant inactivity when his back-seater shouted "Jink! Jink! They're shooting at us!"[31] Even the handling of the aircraft seemed unfamiliar, because unlike at home, the jet was loaded down with heavy bombs, electronic jamming pods, and fuel tanks. Training loads back at home used small, cheap practice bomblets and seldom involved full size live bombs. McCarthy noted on his first takeoff in a combat-loaded F-4 that "once airborne, I felt I'd popped the speed brakes when I came out of the afterburner since we were much heavier than normal and the drag with all the bombs and tanks was much higher."[32] The sensory overload common to one's initial combat experience and unfamiliarity with the new circumstances slowed comprehension, and to the crew's great hazard, delayed reactions. This initial unease with the sensory inputs heightened the play of emotion; fear of the unknown, fear of threats, and most of all a fear of making a mistake in front of one's peers, which posed considerable obstacles to effective performance. It was common for inexperienced crews to not see or hear things that experienced crews considered routine. [33]

Performance improved with experience, but there was precious little time to accommodate an optimal acclimatization to combat. A 1970 Air Force Human Resources Lab

---

[31] A "jink" is a change of direction designed to spoil the aim of an anti-aircraft gunner. McCarthy, *Phantom Reflections*, 38.

[32] Ibid., 36.

[33] This phenomenon of becoming familiar with the surroundings of combat was countered in some units by scheduling new crews on combat missions into low threat areas to help acclimatize them to combat environment. In 1975, the Air force's high-end training program, Red Flag, was created to give crews the equivalent of ten combat missions to get them past the vulnerable first missions.

study found a steady increase in skills and proficiency throughout one's first thirty sorties in combat, but squadron commanders struggled to set aside one sortie per flyer to provide some recent flight experience before putting a man into harm's way.[34] To ease the transition to combat, fresh fighter crews flew a familiarization mission over friendly territory followed by ten to fifteen seasoning missions over Laos or North Vietnam's lightly defended panhandle. But when hard pressed, units had to provide what they could and hope for the best. Col Martin Neuens observed that in 1966 his F-105 unit at Takhli was harried by combat losses and mission requirements: "we kept getting into more and more things up to Route Pack VI…and you got maybe eight [low threat missions], if you were lucky. The better they thought you were coming along, the fewer Route Pack I or easier missions you got. They just didn't have them available."[35] Just like in pilot training when introduced to a new higher performance aircraft or more advanced block of training, commanders in theater tried to gradually expose new pilots to the new demands of combat to help them assert control over the new and challenging environment.

The ability to assert control over one's fears, confidence, concentration, and in turn one's aircraft was a high-stakes issue that obviously improved one's chances of survival, but also affirmed a young pilot's life choices, gave many a sense of excitement, and helped secure the respect of one's peers. Young pilots at their first combat assignment were at the threshold of a life-long ambition to fly a fighter aircraft, and they needed to succeed to validate their life choices or relinquish their dreams. Howard Hill, an F-4 pilot at Ubon in 1965 recalled his long term inspiration rooted in World War II bomber pilot and Korean War fighter pilot heroes and

---

[34] Capt C. Wayne Shore et al., *Proficiency Differences of Pilot and Navigator F-4 Second-Seat Crewmembers: A Southeast Asia Evaluation* (Brooks AFB, San Antonio, TX: Air Force Human Resources Lab, Lackland AFB, TX, April 1970), 5-6.

[35] Neuens, interview, 13.

"thought that becoming a pilot would be, basically, like a dream come true."[36] Young fighter-pilot aspirants envisioned the aerial combat of their imaginations as a thrilling occupation, and many actually found that with experience, they could enjoy the experience in battle.

After overcoming the initial limitations of inexperience, most pilots became competent in their duties and gained self-confidence. As they mastered their in-flight responsibilities, they gained an expanding sense of control over their situation. A belief in oneself and one's abilities conveyed the confidence and commensurate courage to go against formidable defenses like SAM missiles "as long as we don't screw up" in the words of Wild Weasel Mike Gilroy. Going against deadly threats, and coming back alive created the ultimate adrenaline rush that some found intoxicating—a greatly amplified version of the joys of risk-taking Clyde Edgerton experienced at pilot training in the T-38. Ed Cobleigh (who commented on the steady acclimatization to fear in pilot training) believed that fighter crews hit a fork in the road after ten missions. "One fork leads to chemical addiction as you become fonder and fonder of fear's highly addictive chemical by-product, adrenaline. You learn to relish fear, anticipating the shot of adrenaline that follows." G.I Basel found a similar sensation as an exaggerated sense of control and power. "Enough of the enemy took pot-shots at me to keep my attention, but a routine began to develop, and I counted missions with detached confidence." Once accustomed to danger, Basel could refer to enemy fire that had once "scared my pants off" as "pot-shots." "Thinking back, it was a form of insanity. They shot at me every day, and missed. I began to expect that...A famous wise man said it was the most wondrous thrill in life, to be shot at and missed. They did it routinely, and I grew into a Superman in my own mind. I was exempt, they just couldn't hurt me, I was too good!"[37]

---

[36] Hill, interview, 19.

[37] Basel, *Pak Six*, 28, 39.

Cobleigh thought the other fork "numbs your addiction and reverses your craving for adrenaline. On this path, fear is a constant companion, one who must be defeated daily. The guys on this path are the real heroes." Most flyers in Rolling Thunder fell somewhere between Cobleigh's two forks: exuberant in victory over danger, but working to face down fears during lulls and muster the will to return to battle. [38]

The need to demonstrate good flying skills and precise aircraft control had been a continuous experience for fighter crews since their first days in flight training. When G.I. Basel pulled up from his first dive-bomb attack over North Vietnam, he was more afraid of going "blind" than he was of facing the Vietnamese defenses, because he was establishing a reputation in a new community of flyers, upon whom his life would depend for the next 99 missions.[39] Establishing a solid reputation as a competent fighter pilot was just as important to incoming senior officers because, as noted in Chapter Three, a leader's flying reputation lent credibility to his tactical decisions. Senior colonels often had to overcome long staff tours out of the cockpit capped with a rushed senior officer requalification checkout at fighter training that hurried them to their new commands. At the beginning of his tour as wing commander, Col Ed Burdette voiced his apprehension to his deputy John Flynn, "because he wasn't a good -105 pilot, and he knew it." But Burdette "was determined to fly" and the wing surrounded him with talent until he became proficient enough to lead strikes into Route Pack Six. Passing such a trial of leadership made Burdette "as enthusiastic as an Eagle Scout that got his next badge" because he had laid the essential foundation for authority over his fellow aviators. [40]

---

[38] Cobleigh, *War For the Hell of It*, 53.

[39] As already noted, Basel wrote: "I began to panic as I searched the mist . . . my career was on the line, the enemy forgotten." Once he found his leader, he "thanked God for being spared the stigma of being a lost wing-man. I had already dicked-up this mission royally, missing the channel change, gawking at real estate, and probably missing the target" (potentially jeopardizing his reputation as a pilot). Basel, *Pak Six*, 15.

Demonstration of coolness and courage under fire to one's peers was a powerful and long-term motivator that gained one respect and summoned the idealized vision of a fighter pilot. F-4 pilot Richard Hamilton claimed that "it's a real lie if anybody said they weren't scared, we all were" but he noted that pilots wanted to preserve their image so they hid manifestations of their fears to live up to the ideal they had carried in their heads for years. "The whole idea [was] that you had to be tough, [which] was stronger than the fear, and so everybody basically hid it." He recalled pilots called out in their sleep "a guy's name" or "Break!...but nobody ever really said much about it or ever really admitted it, but I know I've woken up a number of times after stuff and you wonder if you were noisy. You kind of worried somebody would find out if you were scared."[41] This same concern for demonstrating self-control also extended to performance in the air.

Ronald Bliss believed that remaining calm in the most extreme situations was "a fighter pilot trait" to be admired. The desire to demonstrate calm even influenced a pilot's final bailout calls made from burning and disintegrating aircraft. Bliss admired a fellow pilot who had calmly radioed "I'm going over the side. I'll see you when the war's over" before ejecting over North Vietnam. When Bliss' F-105 was hit near Hanoi he tried to demonstrate the same quality of calmness with his last radio call before ejecting from his own burning jet. He simply stated "It's

---

[40] Ed Rock described the alternative, of a senior wing leader failing to make the grade. The colonel serving as the 355th TFW's director of operations "had a reputation, deserved or not, for not being able to find the target and was referenced to by some as 'Mr. Magoo,' the humorous, blind and bumbling, but often extremely lucky cartoon character. However it wasn't very funny, and you sure didn't feel lucky if you were drilling around in a high threat area with a mission commander who couldn't find the target while you were getting your ass shot off." Rock, "Wild Weasel III-2 Memories," 234; Flynn, interview, 135.

[41] Hamilton, as already described, recalled scaring himself in UPT when he flew some aerobatic maneuvers without telling his instructor. Hamilton, interview, 40-41.

getting awfully hot now. Tampa Four may have to get out."[42] William Ricks was amazed by the controlled calm some pilots were capable of. As he waited for takeoff as a spare (to fill in for any aborts), he watched a fellow lieutenant killed as his plane exploded on takeoff. When the tower controllers called his flight lead, who had taken off a few seconds earlier, the "tower said [in a] high pitched voice – 'Lead, lead, lead, your number four man just blew up and there's no chute.' And lead came back and to this day I don't know how the guy could do it, but in a very calm, very low voice, said, 'Roger tower, launch the spare.'" Shaken by the sudden fatal mishap, Ricks reflected: "luckily, his was not the flight that I was sparing, so someone else had to launch to fill his position."[43] Ricks witnessed a pilot able to control himself, his voice, and his aircraft, direct the launch of a spare aircraft, and continue on despite the sudden death of his wingman, and was thankful his nerves were not put to the test that day.

Skillful and controlled behavior in battle helped secure a pilot's membership in an elite group of fellow combat pilots, which in turn satisfied his notions of masculine honor. In his history of the concept of honor, author James Bowman argues that "at its simplest, honor is the good opinion of the people who matter to us, and who matter because we regard them as a society of equals who have the power to judge our behavior."[44] Aviators who carried out their flying duties skillfully and stayed calm despite the risks earned the respect of those around them. For flyers in Southeast Asia, the opinion of the other aviators within one's unit and one's aircraft community (the community F-105 pilots, for example) mattered most. The competitive nature of

---

[42] Lieutenants Ron Bliss and Tom McNish arrived at Takhli together and observed the flights with missing planes returning to base in June 1966; two and a half months later, both were shot down, twenty minutes apart, near Hanoi and spent the rest of the war as POWs. Bliss, interview, 37, 50; Hobson, *Vietnam Air Losses*, 73.

[43] Ricks, interview, 20-21.

[44] James Bowman, *Honor: A History* (Encounter Books, 2007), 4.

flyers led to continual comparisons and mutual surveillance which generated an honor culture centered on seeking approval and avoiding shame. In the air, flying mattered and rank did not. Opinions of one's fellow aviators mattered a great deal, because these men saw themselves as a society of equals who had every right to judge each other's behavior when it came to flying. To falter in one's flying skills (like calling "blind") or one's courage was viewed as shameful and unmanly. Conversely, honorable behavior affirmed ones masculinity in the eyes of one's peers and reinforced one's self-image.

Fighter crews and their leaders questioned or praised masculinity to obligate others to their duty, to affirm their own confidence, and to inspire acts of courage. Robert Smith, as noted, forced his reluctant pilot to consider how shirking from battle would be seen through the eyes of his wife and children to encourage him to do his duty. Ronald Bliss and Wilbur Creech feminized two-seat, two-engine F-4 pilots as "wimps" or homosexuals to affirm their own masculinity by amplifying their rugged self-reliance as single-seat, single-engine fighter pilots.[45] Wild Weasel EWO Mike Gilroy found an inexperienced single-seat F-105 wingman assigned to him on a SAM hunting mission lacking enthusiasm for the mission. Gilroy intended to look for SAMs in Route Pack Six after escorting a strike in the lower threat Route Pack Five. During the mission briefing his wingman commented: "you guys are going to Route Pack 6, when you don't have to? You guys are out of your minds!" Gilroy thought "This type of questioning doesn't sit too well with either Glenn [the pilot] or me. But it does go to show you that even among F-105 pilots there exists an occasional candy ass. His questioning is almost a slur on our manhood." During the mission the wingman lost sight and retreated to the safety of Thud Ridge, a point Gilroy reported

---

[45] As already noted, Bliss remarked "we're not wimp F-4 pilots with two guys and two engines. We can handle this stuff" and Creech made a jibe to Phantom pilot masculinity due to the closeness to his back seater: "I've never been against people breathing in my ear, but I didn't want it to come from a back seater on a hot-mike intercom." Bliss, interview, 33-34; Creech, interview, 54.

to the man's operations officer. Chastened by feminization as a candy ass, Gilroy noted the man became "a much different pilot" when they flew together again several months later.[46]

Fighter pilots also recognized bravery with affirmations of masculinity. Robin Olds singled out the small single-engine FACs he worked with in Laos during Rolling Thunder for manly praise. "The FACs did an absolutely outstanding job. Little guys in their little…Birddogs…just outstanding, balls of brass, tremendous."[47] Paul Lew Chesley, the EWO who fought off the MiG attacks on April 19, 1967 received similar praise from a fighter pilot after demonstrating coolness under fire. Chesley tried to convince his squadron of the effectiveness of their electronic gear and directed his pilot over a known concentration of enemy radar-directed fire. "So we said, 'Now, everybody over here, just fly along, gaze to your right.' The two of us peeled off, and went right down near Yen Bay. Sure enough, they took the bait." Using their radar warning gear to detect a radar lock on and time their jinks, Chesley called for his pilot to maneuver at the right instant "and then you'd watch about six rounds of fifty-seven millimeter bang, bang, bang, bang, bang, right exactly where we had been. We did that three times going by Yen Bay to show them it works." In recognition of the courage of this display, a fighter pilot approached Chesley after the mission and commented that "I've never seen such balls of brass."[48] Due to his highly specialized electronic warfare training, Chesley had unique skills and expertise to offer his fellow aviators to help them evade radar-directed fire with the use of their radar

---

[46] Gilroy, "Single Ship Iron Hand," 168, 175, 177.

[47] Olds, interview, 31.

[48] Aviation artist Keith Ferris chronicled many aspects of Air Force participation in Southeast Asia and entitled his depiction of an F-105 Wild Weasel "Big Brass Ones" in appreciation of the masculine courage of the Weasel crews. Chesley, interview, 32-34; Keith Ferris, *The Aviation Art of Keith Ferris* (Peacock Press/Bantam Books, 1979).

warning equipment. His ability to use those skills and power to help his fellow airmen motivated him to expose himself to enemy fire.

Like Chesley, other aviators experienced a motivating sense of obligation to use the unique power and capability of their aircraft directed by their flying skills to accomplish the mission, and to support each other. During Rolling Thunder, airmen felt that strong sense of obligation most acutely within one's flight. The two-aircraft element and four-ship flight were the fundamental building blocks of fighter tactics, and mutual support within a flight was sacrosanct. Col F.C. Blesse, already an ace from Korea because of his aggressiveness, was eager to engage MiG fighters over North Vietnam. He had an opportunity to attack a pair of North Vietnam's most advanced fighters, MiG-21s, unobserved with a high likelihood of shooting both down. Blesse had to choose between two conflicting values, his loyalty to his wingman and his desire to score an air-to-air kill. He gave up this golden opportunity to stay with his damaged wingman, placing formation integrity over personal glory. "I have seen those two Mig-21s turn their tails to me a hundred times in my sleep" Blesse later wrote, "but the two kills would have meant nothing if I had lost my wingman."[49] Mutual support normally meant flying alongside and warding off threats, and arranging other help (refueling, or rescue) on the radio.

One of the most dramatic incidents of the war over Hanoi was an act of courage and incredible flying skill by F-4 pilot Bob Pardo and back-seater Steve Wayne to aid a pair of squadron mates over Route Pack Six. Pardo was the third aircraft of a four-ship flight and he and his wingman, Earl Aman sustained damage over the target. Due to the damage, it was clear that Aman and his back-seater Lt Bob Houghton would not make it back across the Red River. At the time "if you went down north of the Red [River], you didn't even wait for each other. If you

---

[49] Blesse, *Check Six*, 128.

couldn't keep" your aircraft going "until we got back over…the Red, there was no rescue"[50] Despite the conventional wisdom, Pardo was unwilling to leave his wingman behind and attempted a bold and hazardous maneuver to help him using the power and sturdy construction of his Phantom fighter. Pardo directed fellow pilot Earl Aman to lower his Phantom's beefy tail hook and then used the base of his own windshield to push Aman's damaged F-4 the 88 miles to Laos. Once across the border, both aircraft flamed out and crashed, but all four pilots were rescued. The incident, since named "Pardo's Push," invoked the ire of the Seventh Air Force commander, who believed his crews had caused the loss of a good airplane. To head off any punitive actions, Pardo's wing commander, Robin Olds, had to assure it would never happen again, nor would there be any decorations for the crews. When asked why, Pardo was reported to have stated "It just seemed like the thing to do at the time. How could anyone just fly off and leave a buddy?"[51]

Bob Pardo's extraordinary action demonstrated a powerful sense of obligation to his wingman, which was likely bolstered by social cohesion generated within their fighter squadron. Social cohesion within the primary group as a combat motivator has enjoyed considerable attention among military historians and many believe it is one of the primary motivators in combat. Fighter squadrons were renowned for their close-knit highly social environments, but there is cause to view social cohesion during Rolling Thunder with some ambivalence because there was only a limited potential to create strong social bonds of close friendship among fighter crews during the campaign.

---

[50] Norris, interview, 59.

[51] Johnson and O'Connor, Scrappy, 211-212; Andy Connor, "Voices of Veterans: Bob Pardo," May 21, 2009, accessed February 12, 2010, http://www.kbtx.com/veterans/headlines/45677282.html#

There were several factors that favored the creation of strong social bonds, but there were also several significant detractors. First, since combat sorties took six to eight hours to brief and fly, there were ample opportunities for flyers to interact in the safe environment of the squadron operations buildings and dormitories. They shared meals at the officers club, and if they chose, partied there in a loud and lively setting. Many aviators had shared past assignments together and had pre-existing friendships or acquaintances to build upon. They also shared a common culture that centered on flying and fellowship between flyers and their families within communities centered on their flying squadrons.

There were, however, several significant countervailing factors that inhibited the formation of strong social bonds during Rolling Thunder. First, the Air Force adopted an individual replacement policy in 1965, electing to keep squadrons in place and began a stream of individual replacements into and out of these units.[52] At the height of Rolling Thunder, squadrons turned over rapidly. It took an average of seven months to complete a hundred mission tour, so a twenty-four person F-105 squadron could expect to turn over three to four pilots a month. Given the high combat losses in 1966 and 1967, turnovers of five or more pilots a month could be more common.[53] During Robert Smith's first month in command of the 34th Tactical Fighter Squadron at Korat, he lost three F-105s and pilots over Hanoi in a single mission—an eighth of his squadron strength shot down in front of his eyes in one day. Second, although the squadron was the normal social unit in peacetime, Smith noted that with the hectic pace of operations, "It was never practical to get even a majority of our pilots in a briefing" which suggests there was little

---

[52] Donald D. Little and Barry L. Spink, "USAF Personnel Rotation in Southeast Asia (A Chronology) 1961 through 1968," April 2008, 7, Air Force Historical Research Agency, Maxwell AFB, AL.

[53] In an August 1966 report, the 388th TFW wing commander reported that Korat was authorized 117 F-105 pilots. Each month, the wing lost an average of seventeen pilots completing their tours and five pilots shot down, mandating an average replacement flow of twenty-two pilots per month to sustain the wing. Ibid., 18.

time to form a common unit identity.[54] One F-105 Wild Weasel pilot recalled having little to no contact with his squadron commander during his combat tour.[55] F-4 pilot Richard Hamilton thought that losses and turnover led to formation of small close-knit groups, but less so at the squadron level: "it was just like two or three of them were really, really close," but when it came to the squadron, "although you know everybody and you're close, you're not as close."[56]

Third, over the course of the campaign, inbound pilots became more diverse, coming from different Air Force sub-cultures which could inhibit assimilation. Early Rolling Thunder rotations drew heavily on experienced fighter pilots, but as the campaign unexpectedly extended over three and a half years, experienced fighter pilots became more scarce because the Air Force adopted a "one tour policy" that held that no aviator would have to go to Vietnam twice involuntarily until everyone had gone once.[57] Although this spread the stress of combat across a larger population and was based on fairness, it forced the Air Force to cross-train increasing numbers of bomber and transport pilots into fighters. Gen Robert Dixon, one of the architects of the policy, saw cross training as a benefit of the policy because it helped close the SAC-TAC divide. "We would have SAC and TAC, and there would be an irreversible gap between them that would serve to fracture and compartment the Air Force."[58] But the one tour policy drove down

---

[54] Smith, "Robert W. Smith Autobiography," 197.

[55] I only saw him once that I recall; however I probably saw him on other occasions that I simply can't remember after nearly 40 years." Rock, "Wild Weasel III-2 Memories," 235.

[56] Hamilton, interview, 41.

[57] In the words of Air Force Chief of Staff, Gen J.P. McConnell, the one-tour policy was designed to "insure that in so far as is possible aircrew members are not involuntar[ily] assigned for a second SEA tour before all available aircrews have rotated through one tour." Little and Spink, "USAF Personnel Rotation in Southeast Asia (A Chronology) 1961 through 1968," 28.

[58] Gen Robert J. Dixon, interview by Capt Mark C. Cleary, July 18, 1984, 196, Air Force Historical Research Agency, Maxwell AFB, AL.

fighter-specific experience (measured by total fighter flying hours) within the squadrons, and this policy pulled together aviators from outside existing social networks, further reducing social cohesion within Air Force flying units.

Considering these countervailing factors, there is reason to question the importance of social cohesion. Rolling Thunder lacked a universal squadron-wide "band of brothers" degree of closeness that served as a foundation of this form of motivation. A 1994 Air University study of F-105 pilots found control and confidence important "moral factors" in confronting fear, but found no correlation between cohesion and any of the other factors considered. Maj Anthony Grady, the study's author concluded "trust and competence appeared important as expected, but not cohesion."[59] Among Rolling Thunder fighter crews there were certainly very close friendships, and adversity pulled many acquaintances into lifelong friendships, but the powerful and motivating bonds between flyers seemed to take on a more general and collective sense towards the general body of fellow combatants. Many two-seat crews, two-aircraft elements, and four-ship flights grew very tight, especially if the unit schedulers were able to routinely schedule the same aviators together on a regular basis, but there were much looser and non-specific bonds uniting the flyers that motivated them just as powerfully.

A potent form of obligation stemmed from the power of one's aircraft and an aviator's ability to control and direct that power. This obligation inspired acts of considerable bravery to support one's flight and squadron, but also to support distant external groups of fellow flyers well beyond one's own squadron. Large thirty or forty aircraft strike missions drew together men and aircraft from several bases, with most of the flyers unknown to each other. EB-66 crews flew their underpowered and obsolescent jamming aircraft to Hanoi's doorstep and braved MiGs and SAMs to provide close-in jamming support to pilots from all of Rolling Thunder's fighter wings.

---

[59] Grady, "The Moral Domain of War: A View from the Cockpit," 27, 32.

The Wild Weasels figure even more prominently, with their high loss rates. Wild Weasel crews flew into the teeth of SAM sites, and intentionally exposed themselves to enemy fire in support of crews from all of Rolling Thunder's wings. When MiG dangers mounted, the F-4 crews at Ubon flew the most capable American air-to-air fighters and took it as a matter of personal and professional pride to protect the F-105 crews, most of whom they did not know. Robin Olds, the Ubon commander related that "when the MiGs knocked out a bunch of Thuds one day in the latter part of April [1967], Seventh came out and I was called down there and I was told that we were not going to let that happen." Olds put his own crews at the rear of F-105 formations to protect them from stern attacks by MiGs. He told the Thud wings that if they sighted enemy aircraft "I will worry about those. You guys go on. I am right back behind you here. I won't let anybody hurt you." He then reported that "from the end of April until the 25th of August, we did not lose a single airplane in Route 6 to MiGs. Not a Thud." He made a point to note that the only losses were among his own pilots (which was a point of pride) rather than F-105 pilots he did not know. "The first two airplanes lost were my own guys doing their job back there protecting those Thuds. We cut the total losses in Route 6 from horrible to minimal in that time span, and I am goddamn proud of that."[60]

100 Missions: North Vietnam

The men who flew over North Vietnam found personal satisfaction in the freedom and excitement of combat flying. Those who completed the requisite one hundred missions also enjoyed the respect of their peers, which was best symbolized by a red, white, and blue patch that read "100 Missions: North Vietnam." That patch, bestowed by one's peers and leaders,

[60] Olds, interview, 54-55.

underscored several powerful threads of motivation during Rolling Thunder. It was a tangible sign that the man who wore it had mastered his fears, controlled his aircraft and self, and had used his aircraft to accomplish a mission and to support others over the course of one hundred dangerous flights to North Vietnam. Air Force fighter crews' motivation to prove themselves as competent aviators in the eyes of their peers and their sense of obligation and duty coalesced powerfully behind the count towards the completion of a one hundred mission tour. When the Air Force's senior leadership set the standard Southeast Asia tour of duty at one year, they established one hundred missions as a Rolling Thunder tour of duty in recognition of the dangers encountered over North Vietnam.[61] The completion of one hundred missions in North Vietnam became the universal and tangible goal of Rolling Thunder pilots, against which crews could measure their progress. William Norris assessed that the one hundred mission tour "was the only way to go" because of its positive effect on motivation. "One thing I was very proud of was that we didn't have anybody quit flying while I was there, in the face of an extremely tough mission. I think one of the reasons, probably, is the 100 mission incentive. You knew you had something to work for, to get that 100th mission, and I had a lot of people who were on the verge of quitting—that they were really scared."[62] In 1966 and 1967, Thud pilots began to mutter "there ain't no way," which

---

[61] When originally instituted in November 1965, all missions to Laos and North Vietnam were counted towards the 100-mission goal. By February 1966, only missions to North Vietnam counted because Laos was less dangerous. Otherwise, combat tours were one year long, and each 20 missions over North Vietnam subtracted one month from the year. U.S. Air Force Fact Sheet, *Badge of Honor: 100 Missions up North* (National Museum of the US Air Force), accessed April 12, 2009, http://www.nationalmuseum.af.mil /factsheets/factsheet.asp?id=13848; Little and Spink, "USAF Personnel Rotation in Southeast Asia (A Chronology) 1961 through 1968," 12

[62] Norris assessed that the 100-mission goal was a difference between his unit in Korea and Thailand. "The unit I was in in Korea - in one squadron while I was in Korea - we had six people quit flying, and the missions weren't as tough as they were up in the Hanoi area." Norris, interview, 54-55.

was shorthand for there ain't no way to survive a one hundred mission tour.[63] In the words of the Takhli vice wing commander, "statistics proved that the average mission expectancy of a Thud driver was sixty-five [missions]. Thus, there ain't no way. Their definition of a supreme optimist was a Thud driver who quit smoking because he was afraid of dying from lung cancer."[64] Although the odds against completing one hundred missions seemed daunting, the ability to complete one more mission seemed very probable. Focusing on short term goals and emphasizing one's active role in attaining that goal allowed crews to be optimistic in the face of difficult odds.[65]

In mid-1966 the Air Force personnel system began struggling to find enough fighter pilots to replace pilots lost over Southeast Asia and those rotating home after one hundred missions. The Air Force leadership announced a short-lived policy change mandating all pilots to serve full year combat tours. Lt Ronald Bliss commented that the edict "was a death sentence for us. We couldn't make it. We were dead." Bliss's recollection of a conversation with an experienced major after the pilots had smashed a lot of glasses that night in alcohol-fueled frustration at the officer's club bar is worth recounting:

> *Lt Bliss: "What are we going to do?"*
> *Maj Mathiason: "We're going to go up there tomorrow, and we're going to put the bombs on the target."*
> *Lt Bliss: "All right, it sounds good to me….Why?" [Mathiason] had his head down for 30 or 40 seconds. He looked up and, and he was almost crying.*

---

[63] The 1967 Air Force documentary "There is a Way" features four pilots completing their 100-mission tours and was intended to counteract this pessimistic perspective. *There Is a Way*.

[64] Broughton, *Rupert Red Two*, 316-317.

[65] This is similar to a phenomenon observed by Alex Watson among soldiers in the trenches along the Western Front during the First World War. Watson assessed that "by concentrating on short- term risk and overestimating personal control, soldiers were able to convince themselves that they would survive." Alex Watson, "Self-Deception and Survival: Mental Coping Strategies on the Western Front, 1914-18," *Journal of Contemporary History* 41, no. 2 (April 2006): 247-268.

Maj Mathiason: "Pride. We told them we could do it, and we're going to go up and do it"
He [Mathiason] made it. I think he made the tour all right, but it was just self-esteem. That's all it was."[66]

Confronted with an uproar from the field, Air Force leaders quickly reversed the personnel directive, and crews used their mission count to cope with the stresses of combat by measuring their progress to their tour completions.

The F-105 pilots wore Australian bush hats and used the hat band to keep a tally of their missions. There were several conventions; G.I. Basel describes his hat at Korat. "We marked our accumulated missions on the front of our hats with a stroke of a ballpoint pen. This caused each hat to be a personal and valuable thing." Basel especially understood the hats' value, because his was lost when he was shot down and injured, and his friends packed up his belongings for shipment back to the United States. "The marks told each man's story. We used a red pen to specify missions in Pak Six. We put a dot over the marks that were especially hairy, spiced with enemy fire.…We took to drawing small symbols instead of marks for significant missions. A mission that had caused the demise of a SAM site would be represented by a tiny, carefully drawn missile."[67]

The pen strokes on the hats were a visible statement of status, tracked a pilot's progress towards his one hundred mission goal, and served as a powerful motivator. Basel commented on how powerfully the marks affected him: "The hats that displayed numerous red marks drew more respect than either rank or age. I remember my first day at Takhli, staring at a hat that had 72 marks on it, and whispered 'Jesus' to myself. Oh, I wanted those marks! My hat held none then, and I couldn't buy marks, steal them, or even get extra ones for good work. I had to go get them,

---

[66] Bliss, interview, 46-47.

[67] Basel, *Pak Six*, 33.

one at a time."[68] The marks were more than indications of endurance or pure survival because each line represented a high degree of competency and flying skill needed to defeat the air defenses encountered over North Vietnam, and their aggregate indicated the very highest level of flying proficiency. Each mark also symbolized a positive act of willpower and courage to strap into an aircraft and fly it into North Vietnam's hotly defended skies. Remaining on the ground or flying a mission to the more benign skies of South Vietnam or Laos could not add to the count.

In Rolling Thunder's combat wings, a powerful value system arose around the mission count. Newcomers to combat were treated as freshmen; at Takhli, officers who had not flown in combat were not allowed access to the officer's club bar via the back door. After his first mission over the North, Ken Bell was welcomed with a ritual toast "Here's to the f___ new guy!" Which was answered by a veteran: "if I had ninety-nine to go, I'd cut my wrists and sit in a tub of warm water!"[69] At the other end of the spectrum, veteran flyers in the 90+ range were treated with deference. These veterans especially had seen the loss of many comrades. Ken Bell noted that survivors of 90 missions had to be careful to treat other pilots respectfully and avoid withdrawal into an ever shrinking circle of peers.

Many aggressive senior leaders at the wing level and below reinforced the value system by committing to one hundred missions as well. All tours of duty for full colonels were one year, regardless of mission count so there was no personal incentive to complete one hundred missions. F.C. Blesse voiced disgust with the outgoing 366th TFW wing commander at Danang for flying only nine combat missions in eleven months in the F-4. As the wing's third ranking officer, Blesse and his deputy resolved to lead by example and fly one hundred missions. "I said, 'Okay,

---

[68] Ibid., 32-33.

[69] Bell, *100 Missions North*, 80.

we are going to fly one hundred missions North with the outfit. We have to stay a year; they have to stay only a hundred missions, but still we are being paid to be leaders, so let's go.'"[70] Those colonels like Blesse and others who elected to complete one hundred missions provided a heroic role model for their subordinates. Within both F-105 wings, veteran flyers with 90 missions could decline high threat missions at their discretion. The 34th squadron at Korat awarded a gaudy and unofficial "34th 'Blue Max' medal after 90 missions, the point at which each veteran was declared 'Golden'" signifying his completion of enough of the most hazardous missions to honorably fulfill his duty and opt for lower threat missions without any loss of honor.[71] The 355th TFW's wing commander, Col Robert Scott put considerable pressure on his most seasoned pilots when he continued to fly Route Pack Six missions beyond his hundredth.[72] Air Force senior leaders like Scott led by example but collectively paid a heavy price. The 388th wing was devastated by the combat losses of Burdette, Flynn, and Bean—the wing commander, vice commander and wing director of operations—over a three month span. Deaths recorded on the Vietnam Wall in Washington DC are an indication of Air Force senior leaders' willingness to lead by example: nineteen Army colonels died in Vietnam compared to 186 Air Force colonels.[73]

The ultimate reward was a "North Vietnam-100 Missions" patch worn on the shoulder as a badge of honor signifying courage under fire and the honorable completion of a dangerous combat tour. Pilots at Korat designed the patch in 1965, and began awarding them to peers

---

[70] Blesse, interview, 7-9.

[71] Smith, "Robert W. Smith Autobiography," 163.

[72] Bell, *100 Missions North*, 245.

[73] "U.S. Military Casualties in Southeast Asia - Deaths by Casualty Type and Service," *The Vietnam Veterans Memorial -- The Wall-USA*, accessed May 8, 2009, http://thewall-usa.com/summary.asp.

completing one hundred missions in early 1966.[74] Several flight suit patches symbolized achievement and status among Air Force aviators. Pilot or navigator wings, sewn over the breast pocket were one of the earliest badges of status earned by fledgling aviators at the completion of their training at UPT and UNT. At fighter training, F-105 pilots earned a shoulder patch with an F-105 silhouette and "Thud" signifying they had soloed the F-105. Instructor pilots selected for the elite Fighter Weapons School were awarded a coveted "Graduate, Fighter Weapons School" patch depicting a bullet piercing a bull's-eye upon graduation from the demanding and highest level training course and represented a fighter pilot's highest peacetime achievement. Ken Bell was rightly proud to have "earned the privilege" to wear his Fighter Weapons School patch, before departing for Southeast Asia. But en-route to Thailand, Bell encountered three one hundred mission veterans who eyed his patch and advised him, "you won't need your patches over Hanoi. You might as well cut 'em off here so you'll look ready to go when we get there."[75] Bell removed his newly-earned Weapons School patch; the implied message was that in combat, peacetime status and symbols of accomplishment meant little and that a newcomer to combat would have to establish credibility and earn respect within combat's value system where performance in the face of danger, control of fear, and skillful flying in fulfillment of obligations to peers figured prominently.[76]

Wings made elaborate celebrations of the achievement of the one hundred mission mark, greeting crews returning from their final missions with fire trucks, champagne, and a red carpet. The wing commander at Takhli allowed returning pilots remarkable latitude in performing

---

[74] U.S. Air Force Fact Sheet, *Badge of Honor: 100 Missions up North*.
[75] Bell, *100 Missions North*, 18.

[76] G.I. Basel wrote about two other patches awarded during his combat tour, a "River Rat" patch for crossing the Red River in anger, and a "SAM Slayer" patch for completing a hazardous mission with the Wild Weasels. These seem to have been minor recognitions, but physical evidence of rising status. Basel, *Pak Six*, 30, 48.

elaborate low-altitude high-speed flybys over the base before landing. This was highly unusual and demonstrated remarkable recognition from wing commanders who normally frowned on low spectacular flybys of the base, strictly reserved for trained demonstration teams like the Thunderbirds and Blue Angels. But the 100-mission flyby signified a return to non-combat flying, where pilots could more fully appreciate the joys and freedoms of flight without the proximate threat of death stalking them over North Vietnam. The 100-mission patch awarded after the flight was a visible sign of the completion of an obligation to one's nation, peers, and oneself. Ken Bell basked in the public validation, and felt satisfied he had measured up to his fighter pilot ideal. "I had paid my dues and earned my wings as a combat veteran—a select fraternity of the world's greatest fighter pilots."[77] Pilots could now move to other non-combat duties having fulfilled their obligations and able to proudly make honorable contributions in the states. David Winn assessed that "The general feeling of the '100-mission party celebrants,' when they had completed their tours, was that they were awfully glad to have that behind them and that they were hoping to be able to train other people back in the States, if they were assigned to that duty, to minimize the losses that would occur in the future if [Rolling Thunder] continued."[78]

Although Rolling Thunder did not continue past November 1, 1968, air operations ground on for four and a half more years involving different aircraft, missions, threats, and authority in other parts of the Southeast Asia theater, which are the subjects of the next two case studies. The next case study shifts in time and location to focus on the "in country" war over South Vietnam in 1968 (during the war, "in-country" described operations in and over South Vietnam, while "out-country" referred to operations in North Vietnam, Laos and Cambodia). The

---

[77] Bell, *100 Missions North*, xi.

[78] Brig Gen David W. Winn, interview by Capt Mark C. Cleary, February 9, 1983, 103, Air Force Historical Research Agency, Maxwell AFB, AL.

next case study prominently features the key battles of Khe Sanh, the Tet Offensive, the evacuation of Kham Duc as experienced by airlifters, forward air controllers, and bomber crews, which facilitates an assessment of how flight in large crew-operated aircraft was different from Rolling Thunder, and how airmen integrated with, and obligated themselves to fellow combatants on the ground.

Chapter 6: Tactical Airlift and the In Country Air War

The northeast monsoon pulled low clouds and moisture from the Tonkin Gulf up into the Annamite Mountains behind the South Vietnamese coast from November to April each year. In early 1968, the clouds were a mixed blessing for Air Force and Marine airlift crews ordered to resupply an isolated garrison of US Marines and US Army, Navy, and Air Force personnel hunkered down at Khe Sanh. The clouds made locating and landing on the short and slippery asphalt and aluminum plank runway at Khe Sanh a challenge, but aircrew ingenuity and a radar set flown into the strip provided steering for landings and airdrops. As clouds complicated the flow of aircraft into the strip, they also helped conceal the vulnerable transports from the fire of North Vietnamese gunners dug in around the airstrip.[79]

In early March the clouds broke and a fierce battle erupted around Khe Sanh for access into and out of the airfield. Vietnamese sappers dug trenches to within thirty meters of the runway, backed by antiaircraft guns and mortar positions dotting the hills surrounding Khe Sanh. A steady flow of Air Force, Navy and Marine fighter crews from nearby bases and carriers offshore arrived over Khe Sanh around the clock awaiting attack instructions. During resupply attempts, fighter crews flew escort with the transports, or teamed up with forward air controllers (FACs) piloting small spotter planes over the approaches to the base to punch holes in the ring of defenses. On March 16, 1968 a pair of F-4 Phantoms from Cam Ranh Bay arrived overhead to escort C-130s inbound to Khe Sanh. Col Ralph Parr's F-4 carried napalm and the other crew carried iron bombs. Marine Capt Donald Love, a forward air controller, orbited over the base and directed them to attack two mortars bombarding the field from a ravine fifty to 60 yards from the Marine front line.

---

[79] Trest, *Khe Sanh (Operation Niagara) Vol. 1*, 55, 65.

Parr spotted the mortars and made a very low pass to accurately drop his napalm on the position without hitting the nearby Marines. As he flew into the narrow ravine, his back-seater, Capt Tom McManus spotted "a large group of NVA [North Vietnamese Army] troops on our left, shooting down…over our canopy!" McManus reflexively lowered his seat to seek the flimsy protection of the Phantom's thin aluminum skin as "the FAC was screaming for us to break off and get out of there." McManus watched as holes appeared through both wings, and the FAC and Marine battalion commander shouted for Parr and McManus to abort their attack due to the concentrated fire. In spite of the danger, Parr elected to make a half-dozen napalm and cannon runs through the same hail of gunfire. Between runs, Parr explained his rationale to McManus: "Tom, we've been hit but the transports will be sitting ducks here." Because their wingman was equipped with iron bombs and could not drop close to the Marines, Parr further explained "we are the only ones with napalm to do the job. We have to go back in." Although their aircraft suffered twenty-seven hits, Parr and McManus silenced the guns and the C-130s went in unmolested.[80]

As the close-in fight around the airfield secured the aerial lifeline to the base, immense American firepower rained down on suspected North Vietnamese positions in the surrounding hills. Every 90 minutes a flight of three B-52 bombers took off from a base in Guam or Thailand to join the fighters over Khe Sanh to pound the besiegers. These high-flying eight-engine bombers followed precise radar commands relayed from Combat Skyspot ground controllers on carefully plotted bomb runs to release as many as 108 500-pound and 750-pound bombs into drop areas a kilometer wide and two to three kilometers long. Initially ground commanders kept the

---

[80] Jeffrey B. Floyd, *For Extraordinary Heroism: The Air Force Cross* (Alexandria, VA: J.B. Floyd, 1982); John L. Frisbee, "The Pinnacle of Professionalism," *Air Force Magazine*, February 1987; Capt Thomas McManus, "Forty Minutes at Khe Sanh," in *The Legacy of Daedalus: War Stories and Flying Tales*, ed. Lt Col Dale Shaw, Col Clement E. Bellion, and Lt Col Leon M. Shaddox (Paducah, KY: Turner Publishing Co, 2000), 241-243.

bombers at least three kilometers away from friendly positions to minimize the possibility of fratricide. Following a confidence-building trial run that featured two drops of single bombs only a kilometer from the base, on February 27 General Westmoreland cleared the B-52s to drop their earth-shaking and awe-inspiring payloads from a height of eight to ten kilometers to within only one kilometer of the Marine's front lines.[81]

Khe Sanh was a bet on American technology and the skills of American aviators—General Westmoreland put the lives of the Marines and American pride on the line to hold a position he considered geographically significant, but also to seize an opportunity to mass American firepower against a normally elusive foe. The battle at Khe Sanh played to American strengths by pitting American technology wielded by airmen against North Vietnamese manpower in a battle of attrition. After the war, Westmoreland wrote that "the key to Khe Sanh was firepower….I gave it the codename NIAGARA to invoke an image of cascading shells and bombs."[82] The battle was also a measure of American confidence; the Marines at Khe Sanh were outnumbered, surrounded, and the monsoon season had the potential to disrupt American aerial firepower and the logistic lifeline. The battle naturally invited many comparisons to the disastrous French siege at Dien Bien Phu, but the decision to hold Khe Sanh exemplified American

---

[81] The Marine's official history reported that the Marine Regimental headquarters at Khe Sanh supplied 95 percent of the targets for the B-52 strikes for Westmoreland's approval. Westmoreland noted that he slept in his headquarters during the siege to approve urgent requests. Bernard C. Nalty, *Air Power and the Fight for Khe Sanh* (Washington, DC: Government Reprints Press, 2001); Capt Moyers S. Shore, *The Battle for Khe Sanh* (Washington DC: Historical Branch, G-3 Division, Headquarters, U.S. Marine Corps, 1969), 102; Westmoreland, *A Soldier Reports*, 336.

[82] General Westmoreland posited that Khe Sanh "will stand in history…as a classic example of how to defeat a numerically superior besieging force by a co-ordinated application of firepower." Westmoreland, *A Soldier Reports*, 336.

confidence in its airmen.[83] At Dien Bien Phu, French airpower failed to adequately sustain the position with supplies and fire support and the besiegers overwhelmed it. The potential for a Dien Bien Phu-like defeat spurred the American airmen who kept the air route into Khe Sanh open and pounded the hills around the base to keep the Marine position secure. [84]

The fight over Khe Sanh illuminates several key differences between the air war over South Vietnam and Rolling Thunder's air war over the North. Missions over North Vietnam were conducted independent of ground actions, while air missions over South Vietnam prominently featured support of the American, South Vietnamese, and allied ground forces which complicated but also motivated airmen to help the troops below. The threat to airmen over South Vietnam was far less severe than their peers experienced over North Vietnam. Light and foot-mobile insurgent forces had few air-defense weapons beyond those which they could carry by hand through Vietnam's broken terrain. Airmen did not have to contend with MiGs, SAMs, or heavy guns over South Vietnam in 1968, although some became a factor later in the war. This lower threat level allowed a wider range of aircraft to operate over the South: from light spotter planes, to unarmed transports, to aging second-line F-100 fighters. Air Force crews experienced a different degree of oversight and direction from authority. Unconcerned over potential escalation or Chinese intervention precipitated by the war in the South, Washington imposed few limitations on the air war over South Vietnam, and Westmoreland directed a cascade of bombs that rained down there—three and a half times as many bombs blasted South Vietnam than hit the North. Air Force crews, especially the FACs and tactical airlifters were relatively unconstrained and enjoyed

---

[83] Yuen Foong Khong recounts the powerful impact of the Dien Bien Phu analogy on President Johnson. Yuen Foong Khong, *Analogies at War: Korea, Munich, Dien Bien Phu, and the Vietnam Decisions of 1965* (Princeton, N.J: Princeton University Press, 1992), 170-175.

[84] On April 6, 1968 the Army's 1st Cavalry Division fought its way to the Marine garrison, lifting the siege. MACV estimates confirmed the wisdom of Westmoreland's bet: the siege cost the Vietnamese Army an estimated 10,000 to 15,000 men at the cost of 205 American lives. Westmoreland, *A Soldier Reports*, 347.

considerable autonomy, while others—especially the bombers—experienced extensive oversight and centralized control from their military chain of command.

The aviators who flew in the in-country air war experienced different motivational dynamics than the Rolling Thunder crews. Although these aviators' initial motivations (to fly) were the same as the Rolling Thunder's fighter crews, combat and sustaining motivation varied. Tactical airlift crews enjoyed solving the airmanship challenges posed by flying a large aircraft precisely into very difficult places due to Vietnam's primitive infrastructure and challenging weather. Connections to American soldiers stirred a sense of duty among the forward air controllers, who put themselves in harm's way as they controlled airpower's awesome destructive forces to safeguard their charges on the ground, even if it meant they had to break the rules to do so. In contrast, B-52 crews sought perfection in their airmanship, crew coordination, and procedures to guarantee precise and accurate delivery of their massive payloads and to avoid the second-guessing of their superiors. Like their peers in Rolling Thunder, all experienced and craved the freedom, power, and control inherent to aviation. Following a brief overview of the in country war and the key battles of Tet, Khe Sanh, the A Shau Valley, and Kham Duc, the remainder of this chapter describes the experience, mission, risks, and motivations of tactical airlift crews in Southeast Asia. Two subsequent chapters on forward air controllers and bomber crews follow, making up the remainder of this case study on the in country war.

The Air War in 1968—Vietnam's Pivotal Year

The year opened with military attention increasingly focused on the mounting siege around Khe Sanh, but several hours before dawn on January 31, 1968, South Vietnam erupted with insurgent attacks on scores of cities and bases. An estimated eighty thousand People's Liberation Armed Forces (PLAF, commonly called Viet Cong or VC) and twenty-seven thousand

regular North Vietnamese People's Army of Vietnam (PAVN) troops launched the offensive at onset of the Tet holiday (and cease fire), catching the Americans and South Vietnamese by surprise. Although he initially opposed launching an offensive in early 1968, the PAVN commander, General Vo Nguyen Giap sought to encourage a general uprising across Vietnam to collapse the government and force an American withdrawal. If the PLAF/PAVN fell short, Giap made provisions for two subsequent offensives in May and August to follow the Tet offensive.[85]

As towns and cities erupted across South Vietnam, insurgents also attacked several American air bases, achieving their most notable success at Tan Son Nhut where three thousand PLAF/PAVN insurgents from seven battalions penetrated six hundred yards past the base perimeter. Security police and a small Army detachment supported by gunships and fighters reversed the tide and cleared the base by midafternoon, although rocket and sniper attacks continued at Tan Son Nhut and other airbases for weeks.[86] Despite the surprise attack, airmen responded quickly with fire support and supplies for beleaguered garrisons across South Vietnam in response to urgent requests from American and Army of the Republic of Vietnam (ARVN) ground commanders.

With the support of American firepower, most of the Tet battles subsided after a few days, although the fight for the imperial capital of Hue stretched across three and a half difficult weeks. Unlike the unpopulated Khe Sanh plateau that invited profuse use of overwhelming American firepower, Tet's urban battlefield posed a dilemma for an American strategy reliant on firepower and technology, and for the American airmen who executed the strategy. Some aviators, like the

---

[85] Robert K. Brigham, "Why the South Won the American War in Vietnam," in *Why the North Won the Vietnam War*, ed. Marc Gilbert, 109-113; Cecil B. Currey, *Victory at Any Cost: The Genius of Viet Nam's Gen. Vo Nguyen Giap* (Washington DC: Brassey's, 1997), 264-267..

[86] Maj A. W. Thompson and C. William Thorndale, *Air Response to the TET Offensive*, CHECO Contemporary Historical Evaluation of Combat Operations, August 12, 1968, 13-17, Air Force Historical Research Agency, Maxwell AFB, AL.

B-52 crews, were physically and psychologically distant from the problems posed by urban combat, while other pilots, especially the forward air controllers confronted difficult choices stemming from the presence of civilians on the battlefield, which will be addressed in the subsequent chapter on FACs.

Khe Sanh held on throughout February and March with aerial resupply and copious American firepower until the 1st Cavalry division broke into Khe Sanh on April 6. With the relief of the beleaguered Marine garrison, Gen Westmoreland quickly shifted American momentum one hundred miles south of Khe Sanh into the A Shau Valley. The valley was an entrenched base area for the PAVN along a natural line of communications from the Ho Chi Minh Trail into South Vietnam. Steep mountains, poor road infrastructure, and thirty-seven millimeter antiaircraft batteries made the A Shau a forbidding area. Three American brigades began their attack into the valley between April 19 and April 23. The weather and PAVN defenses proved formidable. The 3rd Brigade of the 1st Cavalry Division lost eleven helicopters with another twelve damaged on the first day of the operation. The Air Force's tactical airlift crews faced very difficult challenges getting supplies to the soldiers in the valley. C-130 supply drops provided a lifeline until the abandoned landing strip at A Luoi could be reconditioned and opened for short takeoff and landing C-7 missions. Extremely poor weather and heavy antiaircraft fire made the A Shau drops some of the most perilous airdrop missions of the war. The crews had to fly blind into a deep valley, at times less than a mile from steep slopes on either side. Antiaircraft fire in the valley claimed a C-130 on April 26 and damaged four others over the course of the operation. That no aircraft were lost due to flight into the terrain is a tremendous tribute to the skills of the C-130 navigators.[87]

---

[87] Bowers, *Tactical Airlift*, 332-343.

The insurgents attempted to regain the initiative in May with a series of strikes the Americans labeled "mini-Tet." The ARVN and the U.S. Army's 9th Infantry Division, assisted by USAF airstrikes turned back ground attacks south and west of Saigon, after which action shifted towards the western border. Powerful PAVN and PLAF units attacked a border strongpoint at Kham Duc in early May. Gen Westmoreland assessed that Kham Duc, located in the mountains of the northern Central Highlands "had none of the importance or defensive potential of a Khe Sanh" and ordered its evacuation.[88] US Army helicopters and USAF gunships, forward air controllers, fighters, bombers, and transports worked together to perform a heroic evacuation under fire, although antiaircraft fire downed two C-130s during the evacuation. The crews who flew the Air Force's C-130, C-123, and C-7 tactical transports are the subject of the next section within this chapter. Aircraft and aircrews that flew over Khe Sanh, the A Shau, and Kham Duc ranged from the small, single-seat forward air controllers to the massive six-place B-52 *Stratofortress* bombers. The forward air controllers loitered over heated battles for hours and became immersed in the ground action, while at the opposite spectrum, bomber crews remained distant and detached from events on the ground, isolated by their distant bases, special radio control frequencies, and protective command structure that valued close control at the expense of all other mission aspects. The experience and motivations of the forward air controllers and SAC's B-52 crews are the subjects of the two subsequent chapters.

---

[88] Westmoreland, *A Soldier Reports*, 360.

Tactical Airlift in Vietnam

Tactical airlift aircraft and crews made the battle at Kham Duc possible, by shuttling American troops into the outpost, and then by hustling them out a few days later. In early May PAVN pressure along the Laotian border, 60 miles south of the A Shau Valley, precipitated the deployment of a U.S. Army infantry battalion to bolster the garrison of green berets and indigenous Vietnamese forces at Kham Duc. Four-engine C-130 Hercules transports landed on a six thousand foot asphalt strip at the bottom of a large bowl-shaped valley to disgorge their passengers on May 10, 1968. As the battalion reinforced the garrison's perimeter, a small outpost nearby fell to two North Vietnamese regiments and the next day Gen William Westmoreland reversed his decision by ordering a withdrawal from the camp. A continuous stream of fighters and bombers pounded the hills around Kham Duc as the withdrawal began on the morning of 12 May. Army and Marine helicopters pulled out slightly more than half of the 1,760 defenders and their dependents at the cost of three helicopters.

A stack of hastily assembled C-130 and C-123 transports held near Kham Duc, waiting for their turn to land and pull people out as friendly positions collapsed and the battle became more desperate. Bernard Bucher landed his C-130 and quickly lifted off with 150-200 (or more) Vietnamese irregulars and dependents at 1530 in the afternoon.[89] Under fire the whole flight, Bucher's C-130 crashed on takeoff leg killing all aboard. William Boyd then piloted his C-130 into the strip and made it out with one hundred people. John Delmore's turn came next. Before the flight, he had briefed his crew that "Americans were on the ground there, and had it been us,

---

[89] The number of Vietnamese losses is unknown. When carrying Vietnamese, C-130 loadmasters were willing to let as many on board as could sit on the floor of the cargo bay. Soldiers from the US Army 5th Special Forces group helped load Vietnamese women and children at Kham Duc and estimated as many as 350 were aboard Bucher's C-130. Dr. Alan L. Gropman, interview by William F. Andrews, March 22, 2010; Alan L. Gropman, *Airpower and the Airlift Evacuation of Kham Duc*, USAF Southeast Asia Monograph Series (Washington, DC: Office of Air Force History, United States Air Force, 1985), 50.

we'd expect someone to get us out." Circling over the battle, Delmore's flight engineer, TSgt John McCall thought Kham Duc "looked like something out of a John Wayne movie. There were helicopters making rocket runs, F-4s were bombing. The field was terrible; both sides of the runway were covered with fires." As their C-130 approached it was hit by fire that opened six inch holes in the cockpit and sounded like sledge hammers. At touchdown, the C-130 became uncontrollable and slid off the runway, destroyed. Even though they were eyewitnesses to the carnage, two more C-130 crews willingly followed into the maelstrom of fire to pull out the remaining soldiers and dependents. At 1630 in the afternoon, a C-130 crew reported that three Americans still remained on the ground, but the strip was now in North Vietnamese hands. Lt Col Joe Jackson unhesitatingly took his C-123 transport from the holding pattern and made a precipitously steep and fast descent into Kham Duc for the rescue. Jackson straightened his dive barely fifty feet above the ground, slammed onto the runway and stopped at midfield for the three Americans to sprint aboard. Still under rocket and machine gun fire, Jackson took off and climbed away from Kham Duc for Danang with the last three Americans at Kham Duc.[90]

The dramatic action at Kham Duc on May 12, 1968 drew upon the range of Seventh Air Force's capabilities including fighters, gunships, and forward air controllers, but the battle's heroes were the tactical airlift crews who braved enemy fire in large unarmed aircraft to evacuate friendly personnel from the jaws of an enemy attack. That action illuminates one of the important missions of airlift in South Vietnam: the rapid insertion and removal of friendly forces. After moving an Army brigade by air in just seventy-two hours, in late 1966, Gen Westmoreland told the theater's top airlift general that "if your outfit can perform like this, that is just like my having

---

[90] For his heroism at Kham Duc, Jackson was awarded the Medal of Honor. Col Joseph M. Jackson, interview by Hugh N. Ahmann, October 7, 1971, Air Force Historical Research Agency, Maxwell AFB, AL; TSgt John K. McCall, interview by Hugh N. Ahmann, April 7, 1972, Air Force Historical Research Agency, Maxwell AFB, AL; Gropman, *Airpower and the Airlift Evacuation of Kham Duc*, 17-60.

another division over here because I can move fighting units all over this country where I need them, when I need them."[91] But Kham Duc also illuminates the inherent flexibility of the Air Force's tactical airlift. With little to no warning, airlift crews concentrated over Kham Duc and integrated into the combined air and land operation. Decentralized decisions, made on the spot by airlift crews characterized the operation, as they defined much of the larger airlift operation throughout South Vietnam. Airlift crews, in turn, thrived on and drew motivation from the autonomy they experienced over Southeast Asia. Airlift crews also felt the obligation to use the unique capability of their aircraft to help friendly personnel; at Kham Duc, crews demonstrated their willingness to go into harm's way to rescue fellow Americans and South Vietnamese in extreme danger. Although enemy guns posed a substantial danger to the mission, operational dangers inherent to flight in the South Vietnamese hinterlands often matched or exceeded the danger of the PAVN's guns. The evacuation of Kham Duc indicates the extraordinary airmanship required to precisely pilot large cargo aircraft into and out of South Vietnam's small primitive strips. Delmore's crash indicates that there was no margin for error, which directly provided a daily audit of Air Force airlift crew's airmanship.

Outside the high intensity combat operations at Khe Sanh, Kham Duc, and several other exceptional battles, hundreds of tactical airlift missions plied the airways of South Vietnam on routine cargo missions hauling people and freight across the country every day. The section that follows details the different airlift missions as seen and performed by tactical airlift crews; that section is followed by the risks encountered over South Vietnam, which is in turn followed by an assessment of authority and motivation in the tactical airlift community. This dissertation argues that although the threat of insurgent anti-aircraft fire was always present, it did not figure

---

[91] Gen William G. Moore, interview by Lt Col Arthur W. McCants Jr., March 25, 1981, viii, 120-121, Air Force Historical Research Agency, Maxwell AFB, AL.

prominently in the day-to-day airlift mission. The challenges of operating into and out of primitive forward airstrips with minimal infrastructure posed the biggest threat to airlift crews, and airlift crews derived tremendous satisfaction from their ability to solve those challenges posed by the environment with their flying skills and judgment. Recognizing the need for countless local decisions and innovations to solve the flying challenges experienced across the country, senior airlift commanders deferred decisions for airlift crews and airlift mission commanders to make on the spot. This grant of autonomy encouraged airlift crews to exercise the freedom and control so carefully cultivated during their flight training. When crews were able to solve flying challenges in support of those they had established a personal connection to, they derived even greater satisfaction from successful missions. This happy coincidence of flying challenges and the freedom to solve them as crews thought best served as a powerful motivation for tactical airlift crews flying in Southeast Asia.

"Trash Haulers:" Flying the Tactical Airlift Mission

The Air Force's aviator community underappreciated the value of tactical airlift, but the crews who flew it grew to love their mission and aircraft. During Vietnam, "trash hauler" became an interchangeable noun to describe the men and the planes responsible for hauling cargo over South Vietnam because of the variety of loads they carried. Hauling "trash" lacked the glamour of flying fighter jets or the prominence of high-flying strategic bombers, but the mission was important. Brig Gen William Moore commanded USAF tactical airlift in Southeast Asia from 1966 to 1967 and reflected the same attitude as his crews: "people did occasionally poke fun at us because of the way our airplanes looked. They were slow, and certainly, that was a high-

performance aircraft environment in general, but, by God, we did do a job. We did an essential job, and our airplanes were good for what we were doing."[92]

Three types of U.S. Air Force aircraft performed the airlift mission over South Vietnam in 1968. The four-engine C-130 Hercules was the muscular workhorse capable of lifting sixteen tons of cargo and is the central focus of this chapter. The smaller C-123 Provider and twin-engine C-7 Caribou supplemented the C-130's heavy lifting abilities into smaller airstrips. The twin piston engine C-123 was retrofitted with a pair of auxiliary jet engines that allowed it to lift five tons into small forward strips, and the light C-7 Caribou provided the capability to reach very short airstrips—as short as 880 feet long—with two and a half tons of people and cargo.[93] These aircraft and their crews tied South Vietnam together by hauling people, ammunition and supplies between logistics hubs and primitive forward outposts.[94] When forward airstrips were unavailable, the Air Force's tactical airlifters dropped people and supplies via parachute. In South Vietnam, enemy antiaircraft threats were minimal, although there were several pitched battles like Khe Sanh and Kham Duc that exposed aircraft and crews to heavy ground fire. Throughout most of the war, Vietnam's primitive infrastructure posed a greater threat to operations than did the insurgents, which called for peak airmanship skills and crew coordination.

Although many pilots fresh from pilot training did not seek out tactical airlift assignments, most grew to enjoy the planes and the mission. Older more experienced pilots returning to fly from staff positions found a comfortable home in the tactical airlift community where they could quickly build their confidence in the aircraft and apply their deep flying experience with good

---

[92] Ibid., 126-129.

[93] Capt Robert P. Everett, "Vietnam Airlift is a Human Thing," *Airman Magazine*, October 1968, 6.

[94] Ray Bowers estimated the total Air Force tactical airlift effort in Vietnam at seven million tons of people and cargo between 1962 and 1972, four times the total lifted in the 1948-9 Berlin Airlift. Bowers, *Tactical Airlift*, 691.

effect. Myron Everton checked out in the C-130 as a lieutenant colonel in 1967 and although the size of the C-130 initially intimidated him, he quickly gained his confidence and looked forward to going to Vietnam: "I was kind of looking forward to go over there and fly that airplane and see what I could do with it. I was excited about it."[95] Everton and other C-130 pilots enjoyed the opportunity to exercise their flying skills by shoehorning their big cargo planes into tiny jungle airstrips or by airdropping urgently needed supplies into a drop zone. Navigators appreciated the opportunity to apply their unique skills to locate landing strips and drop zones in spite of Southeast Asia's poor weather or limited infrastructure, and enlisted flight engineers and loadmasters enjoyed the flying and their elevated status as aircrew members.

Mixed officer and enlisted crews operated the planes that sustained the aerial lifelines into and out of Khe Sanh, Kham Duc, and countless other outposts throughout South Vietnam. Commissioned officers served as pilots and navigators, while enlisted volunteers served as flight engineers to manage aircraft systems, and loadmasters to manage the cargo. Aircraft crew chiefs frequently augmented these flight crews to help maintain the aircraft at remote landing sites. The C-130 had a crew of five, while the smaller C-123s and C-7s often operated with crews of three or four. Two pilots and a single flight engineer/loadmaster typically operated the C-7.[96]

Airlift crews split their responsibilities between the flight deck and the cargo bay. The pilots, navigators, and flight engineers manned the flight deck and were responsible for the operation of the aircraft. The C-130's two pilots sat side-by side; each faced a large control yoke and a bank of flight instruments. Between them, a large pedestal mounted all four sets of engine controls. Seated on a platform above and between the pilots, the flight engineer monitored the

---

[95] Myron Everton, interview by Richard Verrone, October 31, 2002, 34, The Vietnam Archive, Texas Tech University.

[96] C-7 crews flew without navigators and their flight engineer doubled as the loadmaster. C-123s flew with or without navigators depending on the mission. Everett, "Vietnam Airlift is a Human Thing," 5, 8.

engines and throttles mounted between the pilots, and ran an overhead panel that controlled the aircraft's fuel and electrical systems. These three shared a grand vista afforded by a greenhouse of large Plexiglas windows that surrounding the forward section of the flight deck. C-130 navigators manned a windowless position behind and to the right of the flight engineer. Their navigation table and instruments faced sideways to the right. There the navigator monitored a set of flight instruments and operated a navigation computer and air-to-ground radar mounted just above his navigation table. In good weather, the navigator stood behind the pilot or copilot with his map in hand to identify navigation checkpoints or drop zones visually. At night or in poor weather, the navigator's instruments, especially the radar, helped to fix the aircraft location. A crew bunk extended across the rear of the flight deck, and a ladder on the left side of the flight deck led about five feet down to the cargo bay.

The loadmasters, assisted by the crew chiefs (when present) ran activities inside the cargo bay. This long narrow utilitarian space featured an aluminum floor with rollers to handle pallets of cargo, or it could be configured with four rows of nylon web seating to accommodate passengers. The loadmasters were responsible for the loading and unloading of cargo and passengers via a cargo ramp at the back of the airplane. The aircraft's four powerful turboprop engines and propellers generated a lot of noise, mandating hearing protection and headsets connected by intercom to communicate as a crew.

The two pilots normally included a more experienced aircraft commander, who flew in the left seat and a less experienced copilot who supported the aircraft commander from the right seat. Aircraft commanders led the crew and were responsible for the decisions in flight and on the ground regarding the aircraft, crew and mission. Skilled aircraft commanders maximized the potential of the entire crew, pulling from their experience and unique expertise to minimize risks and accomplish the assigned mission. To achieve this goal, they had to be familiar with the

personalities of their crew and knowledgeable about all the jobs within the aircraft. Aircraft commanders piloted the plane, especially in tight spots, but were wise to share flying duties with their copilots to help develop the junior partner's flying proficiency.

Copilots had a more limited role, wryly observing that they made radio calls and raised and lowered the flaps as they built up enough experience to qualify as an aircraft commander. Trained to be an Air Force pilot and to be in control, C-130 pilot Gary Jackson recalled "there was a period there where being a new copilot was…kind of hard on my self-esteem…but copilots are generally regarded as a lower form of life, so you get used to being treated that way." Inexperienced copilots, just like inexperienced fighter pilots found the new environment of combat flying overwhelming at first, but learned quickly and regained their confidence. Jackson assessed that his initial inexperience limited his contributions to the mission. "I didn't know where things were. I didn't know how to get a hold of anybody." He believed that his experienced crew could have done fine without him. "My seat could have been vacant and they would have been okay. But as the weeks passed…I got more and more competent and got more and more comfortable with the job." He attributed his growing confidence to his aircraft commander's willingness to let him fly, which also made his copilot duties more enjoyable. "Since my aircraft commander was a very experienced, long time C-130 pilot, he didn't mind letting me fly the airplane. So I got to fly quite a bit." Jackson observed that some other less fortunate copilots were frustrated because they were crewed with senior officers "who had been flying a desk for the last twenty years" and because "they weren't confident in their own skills…they would only let the copilot land if they were going to land on a [long] ten thousand foot runway."[97] In the C-130, copilots needed one thousand flying hours to be able to move up to the left seat, so gaining flying

---

[97] Gary R. Jackson, interview by Dr. Richard Burks Verrone, December 6, 2002, 26, 34-35, The Vietnam Archive, Texas Tech University.

hours as they learned and gained experience was a positive motivator for young pilots.[98] Upon completing C-130 training, co-pilot John Nelson delayed his departure for Vietnam awaiting the birth of his child. Seizing on the opportunity, Nelson elected to spend little time with his wife and chose to fly as much as he could. He quickly racked up four hundred hours, speeding his opportunity to upgrade to aircraft commander, which afforded opportunities to control the plane and lead his own crew.[99]

Navigators were officers with unique training in a variety of methods to determine their aircraft's precise position. Air Force navigator skills included the use of the sun and stars—celestial navigation—to determine an aircraft position over water, and pressure pattern navigation in relation to air masses, which were valued skills on the long 790 mile flights over the open water between Vietnam and C-130 bases in the Philippines. Navigators also operated electronic aids to navigation including navigational beacon receivers, low frequency long range navigation (LORAN) signals, and the use of ground-mapping radar to see and interpret the terrain when obscured by clouds or darkness. C-130 navigators also played a key role in air drop missions by calculating release points and directing the pilots to that point.

In the close quarters of the flight deck, the crew shared many responsibilities. C-130 navigator Leonard Lee recalled "crews exchanged duties often."[100] In many less demanding situations, the crews had more capability than needed to get the job done. As noted, copilots could feel underutilized, as could navigators—especially in good weather along familiar routes. Although C-130s flew around the clock, in clear, daytime conditions on routine flights to known

---

[98] Jackson, interview, 57; John Currey, interview by Dr. Richard Burks Verrone, February 5, 2003, 22, The Vietnam Archive, Texas Tech University.

[99] Nelson, interview, 5-6.

[100] Capt Leonard C. Lee, interview by Col Ray L. Bowers, April 28, 1972, Air Force Historical Research Agency, Maxwell AFB, AL.

airfields, the pilots were able to easily handle the navigation. One C-130 pilot recalled that in 1968-1969 "you did most of the navigation by map reading, and the pilots did it. It was mostly a pilot mission. You, know you, need a navigator in a C-130 for over water," but only a small percentage of C-130 missions involved long flights over water so "there was a lot of make work for them because they didn't have much to do. And a lot of missions could have been flown without them."[101] Voicing a similar sentiment, pilot David Vaughn suggested his navigators were underutilized when he wrote that "the navigator's table was just large enough to accommodate the essential items from the navigator's kit: cigarettes, an adventure novel, the latest *Stars and Stripes*, a box lunch, a coffee cup, and maybe a map."[102] Although these sentiments might be common for routine missions in good weather, many missions required the full measure of a crew's unique talents.

For airdrop missions, night, and bad weather flying, navigators were indispensable. Airdrop missions mandated accurate cargo drops into small drop zones so that the ground forces could easily retrieve the supplies. The drop zone at Khe Sanh was only three hundred yards long; drops outside this small area exposed troops recovering the supplies to enemy fire, while wider misses might put supplies dangerously onto friendly positions or into enemy hands. Navigators calculated release points to account for wind drift to achieve an accurate drop and took immense pride in accurate results. Drops in poor weather provided the greatest challenge to accuracy, and a skilled navigator could accurately drop his cargo with only a glimpse of the pre-drop navigation

---

[101] Borra, interview, 80; Nelson, interview, 27.

[102] David K. Vaughan, "Flying the C-130 Hercules in Vietnam," *Aerospace Historian* (June 1985): 75.

check point, a part of the drop zone boundary, or a pre-calculated offset aim point used to determine the position of the drop zone.[103]

Flight engineers were the experts in the aircraft's systems; they helped ready the aircraft for flight, operated the controls for several systems and advised the pilots. Because of the job's technical demands, C-130 flight engineer Gary Knecht recalled that only mechanics were able to get into flight engineer training. "You had to be an aircraft mechanic. It didn't matter what type airplane." When Knecht trained as a flight engineer in 1966, "they wanted the engineer to know everything as far as the airplane goes." Unlike a mechanic on the flight line, the flight engineer had to memorize many systems. "If you are a mechanic on the line and have a question about fixing something or the way it should be, you open your TO [technical order]. When you are flying, if an emergency comes up, it has to be in your head right then."[104] Flight engineer expertise and professionalism impressed C-130 pilot Anthony Borra. "They were all highly experienced. We never had [a] novice." He recalled leaning heavily on the engineer's expertise: "In the field, of course, if you got stuck at some little Army post like say in Vietnam, say some fire base, your engineer was the one that was going to get you out of there if you had trouble with the airplane."[105]

Loadmasters ran the aft end of the aircraft and were responsible for loading, securing, and unloading cargo and passengers. They assisted aerial port personnel at the airfield to load people and pallets. The loadmaster then secured the pallets to the cargo deck with nylon straps, chains, and tackle so that none of it would shift in flight upsetting the aircraft balance. During air drops,

---

[103] Capt David L. Hosley, interview by Maj Harry Shallcross, September 27, 1967, 15-17, Air Force Historical Research Agency, Maxwell AFB, AL.

[104] SMSgt Gary Knecht, interview by Hugh N. Ahmann and Col David Metz, January 29, 1988, 15, 17, Air Force Historical Research Agency, Maxwell AFB, AL.

[105] Borra, interview, 37.

the loadmasters opened the aircraft ramp located under the tail and prepared it for the drop. During airdrop training back in the United States, loadmaster Ken Kruger found sitting on the open ramp a fun aspect of flying. "We were living in a trailer park right off the base so the airplanes would be flying right alongside the trailer park so I could sit there and wave to my wife as I went by." Secured to the aircraft by a harness, Kruger "never had a worry at all about [falling], so I really enjoyed that." On actual drops he recalled "you might shove the cargo out by hand or you might use an extraction system that pulls it out and you're sitting there with a little handle, emergency release to drop the load if you have to."[106] Loadmasters performed a physically tough job muscling cargo into position, but also had a critical role in calculating the aircraft's weight and balance. At major airfields, loadmasters expected the aerial port personnel to weigh each cargo pallet before loading, but in 1967, there were only four scales in South Vietnam.[107] At forward strips, weighing pallets was impossible without a scale, yet an overloaded C-130 takeoff ate up limited runway, jeopardizing plane, crew, and cargo.

Tactical airlift squadrons matched their officer and enlisted aviators into "formed crews" that stayed together as an integral unit for weeks or months. Aircrew members newly assigned to flying units in Southeast Asia flew with instructors to qualify as mission-ready. Once qualified, aviators looked forward to assignment to a permanent crew that could become very close-knit. The officers and enlisted crewmembers shared a special relationship as aircrew members. They all wore flight suits that set them apart from the Air Force's non-flying communities. Although there was a formal officer and enlisted divide, these crewmembers shared a close and cooperative relationship, sharing common hardships during the flying day and sharing a beer at its end. As an

---

[106] Kenneth Kruger, interview by Dr. Richard Burks Verrone, February 25, 2003, 19, The Vietnam Archive, Texas Tech University.

[107] Bowers, *Tactical Airlift*, 257.

enlisted crewmember, Kenneth Kruger appreciated the closeness to his officers. "I saw the way [the Navy] lived and the way they treated enlisted men…in the Air Force, I was on a flight crew, so you're right there with your crew all the time, so whether it's a major or a colonel or whatever you're flying with, you're very close to him and he's close to you because you're doing the job directly for him, so it's a whole different situation."[108] Although the military maintained a social divide between officers and enlisted members, aircrews blurred many of these distinctions because of the close relationships built over combat deployments. This close relationship could cause problems in the eyes of other officers. Kenneth Kruger's aircraft commander broke normal protocols and invited him into an officer's club (in civilian attire) for several beers. The next morning, an officer accosted Kruger, who had seen him in the officers' club. "This little, real fat captain was standing there and he says, 'What were you doing in the officers' club last night?' I said, 'Well, I was invited.' And he says, 'You're not supposed to be in there.' And I said, 'Well, I was invited.' He said, 'I don't care, you were not supposed to be in there,' and then he started chewing me out about it."[109]

Combat flying pulled C-130 crews together because they flew in South Vietnam through a series of fifteen-day road trips from the main C-130 bases located on the western Pacific rim. Twelve C-130 squadrons from four bases, Mactan and Clark Air Bases in the Philippines, Ching Chuan Kang Air Base in Taiwan, and Naha Air Base in Okinawa provided about one hundred aircraft for operations over Southeast Asia in 1968. The remaining aircraft and crews trained at home base, or flew routine cargo missions around the western Pacific.[110] The C-130 bases of

---

[108] Kruger, interview, 4.

[109] Ibid., 37-38.

[110] Bowers, *Tactical Airlift*, 181.

operation remained out of theater to limit the American manpower footprint in Vietnam, save the costs of thousands of airmen permanently based in Vietnam and maximize efficiency, because sorties and aircraft not used in theater could fly elsewhere in the Pacific.[111] C-130 squadrons ran their administrative, indoctrination, and command functions from these permanent bases. New aircrews received initial training at these home bases, but were quickly awarded a basic qualification and fed into the Vietnam rotation with instructors to train and certify them in advanced airlift tasks.

Once a crew arrived in theater, C-130 crews operated from airlift detachments at Tan Son Nhut near Saigon, and Cam Rahn Bay, Tuy Hoa, and Nha Trang spaced along Vietnam's coast.[112] Local detachment commanders served as little more than schedulers, who matched crews with missions to maximize scheduling efficiency that imposed a physical cost on the flyers. By 1968, crews normally flew twelve hours a day and returned to their forward detachment for fourteen hours of rest, followed by another twelve hour flying day. C-130 aircraft commander Frederick Nyc thought that "the schedules that we flew left a lot to be desired" because "the schedule was moved up two hours each day." As a result, "in only six days, we were going to work at the time we quit six days before. To say that this screws up your mental dock and sleeping apparatus is an

---

[111] In the words of the 834th Air Division commander: "I think, cost wise, TDY [temporary duty] worked better, and kept us balancing our requirements against capability very well. When you didn't have a big push going on, you didn't need 96 C-130's in-country (as we had during Tet), we'd send them back out of country–all those airplanes, all those people—rather than keep them sitting, around in-country." Maj Gen Burl W. McLaughlin, interview by Col Louis P. Lindsay, April 20, 1970, 16, Air Force Historical Research Agency, Maxwell AFB, AL.

[112] At the C-130 peak strength in March 1968, Cam Rahn Bay hosted fifty-one C-130As and C-130Es, Tan Son Nhut held twenty-seven C-130Bs, while smaller task forces at Tuy Hoa hosted ten C-130Es, and Nha Trang hosted eight C-130Es. Bowers, *Tactical Airlift*, 248, 329, 669.

understatement."[113] Because squadron commanders were based a thousand miles offshore and detachment commanders were focused on schedules rather than crews, both became little more than administrators. Because of the C-130 workload, crews spent little time at home base with their squadron, and did not identify with the administrative supervisors at the airlift detachments in country, which combined to reinforce their identity as a crew over their identity with their squadron or wing.

Although the tactical airlift aircraft were slow and noisy, their crews developed a great affection for their unique characteristics and were proud to fly them. Pilots appreciated that the C-130's four turboprops delivered a great deal of power, the aircraft was surprisingly responsive and agile for a large transport plane, and these two qualities produced a great deal of flexibility and freedom in how the crews flew their missions. When Lt Col Myron Everton transitioned into the C-130, he moved up from twin engine transports, and the C-130's powerful turboprops immediately impressed him. "Well, the thing that you immediately notice when you transition to the jet props is the power. Those things are powerful. [On the] C-130, you can hold your brakes locked, run her up and get her at full power, crack the flaps and it practically leaps in the air."[114] Anthony Borra observed that although his aircraft had nowhere near the performance of the T-38 trainer he flew in UPT, he saw other favorable characteristics that made the C-130 "enjoyable to fly. It's an outstanding instrument airplane. It's a very reliable airplane." Although he sustained combat damage, Borra reported I "never had any problem getting my airplane back. It was a fairly forgiving airplane" Borra and most other C-130 crews appreciated the aircraft's handling,

---

[113] Earlier in the war, crews flew as many as fourteen hour days, and at Tan Son Nhut the schedule advanced four hours per day, posing even greater fatigue challenges. Frederick F Nyc, *Blind Bat: C-130 Night Forward Air Controller Ho Chi Minh Trail* (Austin, TX: Eakin Press, 2000), 29; Gropman, interview.

[114] Everton, interview, 28-29.

which was exceptional for a large transport: "it was exciting to fly, certainly for a four-engine transport. It's amazing what you could do with that airplane."[115] Gary Jackson was so pleased with the aircraft's handling he likened it to early jets. "We could take off and climb…at…what looked like just an improbably [steep] climb angle for a big airplane like that. It had a performance. Some of the older pilots said, the performance of a C-130 was comparable to the old T-33 jet trainer, the first jet trainer, but it would climb about that rate and it cruised about that speed, and it handled [well], except you couldn't do aerobatics in it, but it was very nimble, and the things we did in it were really a lot of fun."[116]

The C-130 provided a substantial jump in navigational equipment over earlier transports. The C-130's radar gave a picture of the ground below that proved invaluable in finding safe routing through rough terrain. The aircraft also had a Doppler radar system that estimated the aircraft position and drift—another substantial jump beyond the C-123 and C-7. Howell Smith appreciated that the aircraft carried "all the equipment we needed as far as I was concerned as a navigator," while navigator Steven Katz (who, as noted, did well at UNT because he had studied accounting) appreciated that it was a good airplane, a little noisy, a little slow but it had a good mission."[117] The aircraft also had its partisans among its ground crews. Wilson Harrison flew as a C-130 crew chief and the aircraft's rugged construction impressed him. "I've seen it come home

---

[115] Borra, interview, 37-38.

[116] Jackson, interview, 27.

[117] Maj Howell W. Smith, interview by Lt Col Robert Eckert and Maj Harry Shallcross, August 1967, 11, Air Force Historical Research Agency, Maxwell AFB, AL; Col Stephen Katz, interview by Dr. Richard Burks Verrone, January 14, 2003, 17, The Vietnam Archive, Texas Tech University.

with one engine. I've seen it with steel [bolts] in the wings. I've seen half the wheel wells blown off. The nose shot off.…I think it's the best aircraft in the world."[118]

Although the tactical airlift mission was crucial to the operation of the entire theater, it was not a glamorous or high-visibility one. Crews flew long twelve hour days, often with ten or more intermediate stops around the country. Ken Kruger recalled this could be very fatiguing in South Vietnam's heat. "The worst day we had is, I had I think it was about fourteen flights in one day and we were down to the last flight and I was really, really ragged." Each leg could have a different type load depending on local needs. "We'd carry everything. We'd carry C-ration, POL drums, trucks. We'd carry troops, just–you name, it we hauled it."[119] Anthony Borra recorded some G.I. graffiti that seemed to capture attitudes towards the tactical airlift community: "C-130 crews—the unwilling led by the incompetent, hauling the unnecessary for the ungrateful."[120] Likewise, pilot Gary Jackson recalled the mission did not win much acclaim and were often routine and unremarkable. "Well, they said it was trash hauling. That's what we called ourselves were the trash haulers, and you'd be hauling every imaginable kind of cargo, and you'd be hauling it in from the big bases with the long concrete runways and you'd be picking your cargo up there and you'd be taking it out to the short airstrips in the jungle. At that time there had been a few of the hairy missions that become legendary that people talk about, you'd hear about those, but most of it was pretty routine."[121]

---

[118] Wilson Harrison, interview by Richard Verrone, April 23, 2003, 10, The Vietnam Archive, Texas Tech University.

[119] Kruger, interview, 30-31.

[120] Borra, interview, 86.

[121] Jackson, interview, 28.

With so many stops per day, flying and airmanship dominated the tactical airlift experience. Crews had to stay focused on safely getting into and out of many different airfields because arrivals and departures called on many airmanship skills otherwise untapped while cruising at altitude on autopilot. Arrivals and departures mandated solid preparation and planning to adjust for runway conditions, weather, surrounding terrain, and cargo loads. Takeoffs and landings, especially at high gross weights into short runways required solid pilot skills to control the aircraft, and crew coordination to maximize crew effectiveness. This experience differed from other aircraft in the theater. Rolling Thunder's fighter pilots took off and landed about one hundred times over the seven months in a hundred mission tour, but their focus was on the attack run, and they saw takeoff and landing from their long, well-maintained runways as a minor administrative aspect of a combat mission. B-52 pilots looked forward to performing takeoffs and landings, but only flew one every twelve hours of flight time because of their long missions from Guam. C-130 crews, on the other hand, flew 10 or more missions a day and might take off and land one hundred times in two weeks. Getting into and out of Vietnam's varied airstrips was the essence of their mission. In fifteen months of piloting the C-130 over Southeast Asia David Vaughan wrote that "I landed at every major and minor airfield in the theater. My logbook shows that I visited 7 airfields in Thailand and 36 airfields in Vietnam." Although he found some airfields were difficult to get into and out of, "all airfields were challenging in one respect or another; even the longest airfields…offered some excitement."[122] Hectic daily flight schedules and busy timetables mandated quick turnarounds on the ground between flights.

Rapid turnarounds isolated the pilots from the cargo and the mission. This was especially true of loading and unloading where the pilots kept the engines running for a fast departure. In

---

[122] Vaughan, "Flying the C-130 Hercules in Vietnam," 78.

these situations, both pilots remained on the flight deck and at their controls as the loadmaster dealt with the cargo and passengers. The physical distance from the flight deck to the cargo bay equated to the distance between "just flying" and the flying the mission. The psychological distance from the flight deck to the cargo bay increased further by the routine and repetitive sorties flown day after day. Trying to stay on a schedule with 10 interim stops in a day, the flight deck crew focused on keeping the schedule and might have little interaction with the cargo load, passengers, or their purpose. Gary Jackson recalled "when we landed in a remote airfield, we kept the engines running, so we were sitting in the seat and they [the passengers] were on board and off board, so there wasn't much interaction from my point of view. I think the loadmasters in the back…interacted with them quite a bit. I think to the troops we were just a bus service, and not a particularly comfortable one."[123] The noise of the engines and the physical distance between the flight deck and the cargo bay limited interactions and connections to the mission for the flight deck crew.

At times the flight deck crew intentionally kept their distance from the mission and the war. The proximity of the war and its impact was evident when tactical airlift crews transported American remains from the field to major terminals for return to the United States. The sights of body bags strapped side by side onto cargo pallets were sobering; the bags were not airtight and the smells from the body bags were especially unpleasant and memorable. Ken Kruger recalled carrying a lot of bodies as the loadmaster. "We'd get them on board and they'd stink to high heaven and that was in a sealed bag." The crew could not do much about the smell, except "just live with it, not much you could do. You spray some stuff in the airplane after you got them off, but some of the airplanes stunk pretty much, especially if you got a bag that leaked, then the

---

[123] Jackson, interview, 43.

airplane stunk forever."[124] C-130 pilot John Currey recalls remaining in the cockpit as remains were loaded, providing physical and psychological distance: body bags "were things that the loadmasters dealt with. When we did that, we didn't go back in the back of the cargo compartment. We'd see those things on the pallets, on the ramps and we knew we were carrying them but we didn't dwell in the area or think about it much. I think the idea was really we would put it out of our mind and just go fly."[125] By "just flying" Currey held the enjoyment and challenges of flying in mind to avoid the uncomfortable meaning behind it. Gary Jackson observed "When you're flying you're insulated from all that…you can fly a whole Air Force career and then never get close, [to death] and that's the closest it got for me, that and hauling the wounded."[126]

The exception was when crews experienced a personal connection with the men they were supporting. A group of men in a desperate situation like Kham Duc, or even the plight of a single trooper could provide a powerful motivation. On the ramp at Pleiku, a physician approached navigator Richard Marks and his aircraft commander. "They'd just had a young trooper who had gotten…a very serious head wound and asked us if we could take him out of there. We said yes, we could take him back to Saigon, it's an hour and ten minutes." The physician assessed the soldier would not survive the long flight so the airmen decided to attempt a hazardous landing at nearby Qui Nhon, even though the one-hundred foot ceiling was far below the required 3,000 foot minimum ceiling because of high terrain adjacent to the field. Guided by Marks' precise radar directions, the crew landed successfully after a twenty-five minute flight.

---

[124] Kruger, interview, 34.

[125] Currey, interview, 25.

[126] Jackson, interview, 37.

"The weather was so bad….We were the only airplane that landed there that day." According to Marks, "We took a very big risk. I've never done it before and I've never done it since in my flying career," but Marks believed it was worth it because they gave the wounded soldier a chance.[127]

Although many crews felt only an indirect connection to the destructive side of the war, others sought opportunities to immerse themselves in it. Small numbers of C-130s and C-123s flew special missions during the war dropping special payloads (including massive bombs) or flying as forward air controllers (FACs) over the Ho Chi Minh Trail at night. Frederick Nyc returned to flying from a teaching assignment and sought out an assignment to his wing's forward air controller detachment in 1968 after "five months of hauling every kind of cargo in and out of a hundred red mud airstrips" in the airlift mission. Nyc's wing maintained a detachment at Ubon Thailand that flew nightly under the call sign "Blind Bat." Within the airlift wing, aircrew opinions on the FAC mission "were miles apart. Some pilots hated it, some did their best to avoid it, and some felt that it gave them a real sense of accomplishment." Nyc and his crew thrived on the excitement of flying low over the Ho Chi Minh Trail at night and directing air strikes on truck concentrations they located with flares and night observation devices. "With very little effort, I had been able to convince my crew that we had a big responsibility to the mission of interdicting the nightly supplies, and to the safely of the crews who nightly 'put it on the line' to hit the targets that we were able to find."[128] Anthony Borra checked out in the C-130 program to drop eighteen thousand-pound "daisy cutter" bombs to create helicopter landing sites in South Vietnam

---

[127] Marks noted later that his leaders "didn't know whether to give us a medal or what, but we had sixty people on board and they claimed that we risked everybody's life to save one and so they decided to do nothing." Marks, interview, 34-36.

[128] Nyc could have taken a fighter assignment but he asked for the C-130 as his aircraft of choice to fight from. "I just felt more comfortable in multi-engines" because of his previous flying background in multi-engine aircraft. Nyc, *Blind Bat*, 8, 30-31.

and against enemy positions on the Ho Chi Minh Trail in Laos, which satisfied a desire for recognition among his peers as one of the best. "I got selected for some special missions and that reinvigorated that pride." Just like his fighter pilot peers flying in Rolling Thunder, Borra valued his standing as an aviator in the eyes of his fellow airlifters. Within a unit that had few opportunities to stand out in the routine business of hauling cargo, Borra saw the opportunity to qualify for special missions a way to earn respect. "You're always trying to meet your peers' expectations and your peers had pretty high expectations. And so getting selected for those missions, I got to do more things with the aircraft."[129] Nyc, Borra and many other C-130 crews braved substantial enemy defenses over Laos, which were far more hazardous than those encountered over South Vietnam on routine airlift missions.

Small Arms and Small Runways: Risks over South Vietnam

Airlift crews, like other aviation communities had to balance their missions against the risks of flying over South Vietnam. Insurgent small arms fire posed a danger to any aircraft at low altitude throughout South Vietnam, but to airlift crews, the enemy threat was less dangerous than the operational dangers posed by flying in South Vietnam's limited aerial infrastructure. Bad weather and short dirt runways, and aircraft malfunctions claimed more C-130s than enemy guns. The Air Force lost twelve C-130s in flight over South Vietnam in 1968. Five went down because of enemy fire and the other seven were lost in mishaps.[130] The crews believed they could manage

---

[129] Borra, interview, 38.

[130] Sapper and rocket attacks destroyed three additional C-130s and HC-130s on the ground, and antiaircraft fire claimed one C-130 flying a Blind Bat FAC mission over Laos in 1968. This account includes a C-130 loss on September 6, 1968 as a mishap, illuminated by David Vaughan's account. Although some accounts list antiaircraft fire as the cause, which would change the balance to six losses from enemy fire and six from mishaps. The USAF suffered fifty-two total C-130 losses between 1962 and 1973: twenty-one from accidents, nineteen from enemy fire, and twelve from ground attacks. Hobson, *Vietnam Air Losses*, 131-

and mitigate threats with smart tactics to avoid the threats, and apply their peak flying skills and crew coordination to manage with the dangers of flight encountered in the skies and on the runways of South Vietnam.

Of the range of enemy systems, PAVN and PLAF small arms fire posed a widespread but minimal threat to airlift operations in South Vietnam. MiGs and SAMs posed a serious threat to Rolling Thunder crews operating over North Vietnam, but Seventh Air Force applied vigorous efforts against any North Vietnamese efforts to open fighter bases or SAM sites in the lower panhandle that would jeopardize aerial operations in South Vietnam. The two-seat F-100F "Misty" forward air controllers were especially vigilant for signs of SAM build-ups in Route Pack One and enjoyed considerable support in striking embryonic SAM capability, so C-130 crews did not have to be concerned with these lethal systems in 1968. The heavy antiaircraft guns encountered over North Vietnam and Laos were also largely absent from South Vietnam through 1968. The fifty-seven millimeter S-60 gun was the size of a large truck. It measured more than twenty-eight feet long and weighed five tons, so it was not suitable for stealthy and swiftly-moving insurgent operations in the South. The smaller (two and a half ton) M1939 thirty-seven millimeter gun was more mobile, but only found in a few strongly-held insurgent positions like the Khe Sanh siege and the insurgent stronghold in the A Shau valley, sixty-five miles west of Danang. The size and weight of these substantial antiaircraft pieces did not mesh with light and elusive guerilla units, nor would they permit the rapid movement necessary for regular PAVN units to evade U.S. search and destroy operations.[131]

170; Bowers, *Tactical Airlift*, 689; David Kirk Vaughan, *Runway Visions: An American C-130 Pilot's Memoir of Combat Airlift Operations in Southeast Asia, 1967-1968* (Jefferson, NC: McFarland, 1998), 187.

[131] After the 1968 Tet Offensive PAVN units became heavier, more mechanized, and more conventional and included greater numbers of more capable anti-aircraft artillery. By the start of the 1972 Easter Offensive, the environment over South Vietnam became more deadly with the introduction of larger AAA and portable shoulder-launched SAMs.

More easily concealed and transported machine guns and small arms posed the most substantial insurgent threat to aerial operations over the South in 1968. These small but ubiquitous weapons were fairly inaccurate because they lacked the computing sights of larger antiaircraft artillery pieces used over the North. Their small sizes limited their effective reach to short range and low altitudes below 1,500 feet. The large numbers of daily airlift sorties and large numbers of small arms resulted in regular hits on airlifters (about fifteen a month in 1967), although most hits were non-critical because of the large size of the aircraft and the small projectile.[132] Occasional lucky hits in an engine or critical aircraft system could result in a loss. Takeoff and landing were especially critical because aircraft were low and slow, and loss of an engine could be devastating. As already noted, the war's most significant inflight loss was on May 12, 1968 during the evacuation of Kham Duc when machine gun fire hit and knocked down Maj Bernard Bucher's heavily laden C-130 right after takeoff, killing all aboard.

Despite the drama and tragedy of highly visible losses like that at Kham Duc, most crews did not perceive an unmanageable risk. Most crews took a few hits over the length of a tour in Southeast Asia, but critical areas were small in comparison to the overall size of the aircraft. A limited ability to perceive attacks shaped the experience. The small muzzle flashes and faint tracers from small arms made fire difficult to see in the daytime. The flight deck configuration restricted downward and rearward visibility; the pilots sat nearest the cockpit windows had the best visibility, the flight engineer was further from the windows and had a more restricted downward view, the navigator, positioned behind the engineer and pilots had even less visibility unless he was standing behind the pilots looking for visual references. C-130 navigator Katz

---

[132] Jackson, interview, 45; John Schlight, *The War in South Vietnam: The Years of the Offensive, 1965-1968*, The United States Air Force in Southeast Asia (Washington, DC: Office of Air Force History, United States Air Force, 1988), 142.

never saw any fire through his tour in 1967-1968: "I don't remember ever seeing anybody shooting at us….it was, to me it was fairly routine flying."[133] The loadmaster and if present, the crew chief, had almost no visibility from the cargo bay. Although airlift crews wore light headsets instead of the sound insulating helmets worn in fighters, the noise of the engines drowned out most possibilities of hearing small arms fire. Hits might be heard against the fuselage (with sounds like gravel on metal), but hits on the wings might go unnoticed until a post-flight inspection.[134]

Because small arms fire was ineffective at all but the lowest altitudes, crews sought to minimize their exposure by remaining at medium or high altitude as long as possible. Medium altitude flight and flight off the coast were safe from fire, while aircraft taking off or landing were most vulnerable. In response, crews modified their normal peacetime practices. Instead of flying long, steady straight-in instrument approaches to landing, crews routinely flew to their forward destinations high and made a tight spiral descent over the landing field to stay close to defended ground and to minimize over-flight of hostile terrain.[135] David Vaughan stated: "in actual combat conditions in Vietnam…we never, *never* flew any part of a landing pattern under 1,000 feet, an altitude from which we descended only on a steep final approach. To fly lower than 1,000 feet near any airfield, including Tan Son Nhut at Saigon, was to invite ground fire."[136] C-130 pilots enjoyed flying the short and steep final approaches because it gave them the opportunity to wring maximum performance from the aircraft and exercise their piloting skills. Sharply maneuvering a

---

[133] Katz, interview, 18-19.

[134] Currey, interview, 21.

[135] Normal instrument procedures featured three to five mile-long final approaches with a two and a half to three degree glide path. This peacetime procedure placed an aircraft below 1,500 feet on a predictable course for two to three minutes.

[136] Vaughan, "Flying the C-130 Hercules in Vietnam," 76.

large, lumbering transport was enjoyable, and many pilots reported that type of flying as fun. Gary Jackson reminisced that "the things we did in it were really a lot of fun. Assault landings were fun, low altitude parachute extractions, and troop drops and heavy equipment drops, all those things were fun to do."[137]

A few pitched battles, such as those at Khe Sanh, Kham Duc, the A Shau Valley (all in 1968), and later at An Loc (1972) mandated flight into contested low altitude airspace, but were exceptional cases. Crews saw day to day operations into and out of remote fields with minimal infrastructure as a bigger threat than Vietnamese guns. Although the infrastructure developed over the course of the war, South Vietnam lacked navigational aids to guide aircraft, radar control and airfield control towers to help them avoid midair collisions, remote weather reporting to find out destination weather in the hinterlands, and sufficient instrument approaches to get down through poor weather. Gary Jackson noted "yes, our squadron lost several" aircraft, but losses were caused by "operational accidents, mostly. There was, I think, maybe one that was suspected it was enemy action, it was shot down. Our hazards were operational hazards; I didn't worry too much about the Vietcong."[138]

Vietnam's primitive aerial infrastructure meant that few instrument approaches were available to safely penetrate cloud layers. Monsoon clouds and rain posed a dilemma for crews; without an instrument procedure, crews had to choose between blind letdown through the clouds, ducking down through holes in the cloud layers, or flying an extended low altitude route from areas with good weather to the destination underneath the clouds. All three approaches entailed risks; F-100 pilot Lester Frazier described a C-123 crash near his base. The C-123 was climbing

---

[137] Jackson, interview, 27.

[138] Ibid., 40.

through the weather and nearly cleared a mountain top surrounded in cloud. The crash killed the entire crew except two passengers sitting near the open cargo door. "The C-123 almost cleared the peak; another thirty or forty feet was all they needed when the bird started clipping off treetops. Neither survivor recalled a change in engine sound prior to impact, indicating the pilots were probably at maximum power or were on full instruments and didn't realize they had a problem until the trees started beating the aircraft apart."[139]

Flights into holes through low-lying clouds entailed similar perils. Although visual contact with the ground could be reassuring, flight into small holes in the ceiling could be perilous because of poor visibility or high terrain extending into the clouds. Prolonged flight at low altitude exposed crews to ground fire, but more significantly, it could lead to a dead end, trapping a heavily laden transport between low-lying clouds and rising terrain that might exceed the aircraft's capability to climb. Gerald Prather recounted getting into Khe Sanh though a small opening in the clouds: "I found what we pilots call a glory hole. When you are flying over a field and the weather's bad and you can't find it, you find a glory hole, and you drop down through the glory hole and make your landing. It can also be called a sucker hole because it could close up on you real fast."[140] Rapid and accurate orientation to the terrain was a must when ducking through a hole in the clouds so that the crew could avoid hazardous terrain and find their way to the destination. David Vaughan had a similar experience flying into Khe Sanh that taxed the full capabilities of his entire crew to fly through a "preposterously small" break in the clouds, fly under the clouds at 200 feet, and then locate the field and land safely.[141]

---

[139] Lester G. Frazier, "Trash Hauler Mountain," accessed February 23, 2010, http://lesfrazier.com/trash.htm

[140] Maj Gen Gerald L. Prather, interview by Hugh N. Ahmann, June 6, 1991, 11-12, Air Force Historical Research Agency, Maxwell AFB, AL.

[141] Vaughan, *Runway Visions*, 144.

Flight under the weather exposed the aircraft and crew to the risk of ground fire. Ground fire hit John Nelson's C-130 in the wing as they ran in low under a very low cloud ceiling between Danang and nearby An Hoa. The gunfire caused a fuel leak and "we were engulfed in flames before we got to An Hoa. We were burning in the air. The aircraft commander ordered me to shut down the #1 and 2 engines and that's both of them on the same side." The crew set the burning aircraft down at An Hoa, but "with two engines out we couldn't use [reverse thrust to slow down due to the asymmetry], so we landed, kind of like landing without brakes….the whole tip of the wing and the outside engine fell off on the runway. We were still going about 50 miles an hour or 50 knots when we departed the runway and ran out through the departure end of the runway through a jungle and through a minefield." The landing lightly injured Nelson and his flight engineer, and both received Purple Hearts. The rest of the crew was unharmed, although the fire destroyed the aircraft.[142]

Many forward landing sites posed a challenge to crews and aircraft because of primitive airfield conditions, short runways, and uncontrolled helicopter traffic. Dirt runways presented rough or pocked landing surfaces that deteriorated further in rainy conditions. Airlift pilots recall the unique challenges presented by each airfield. Airfields with active Army helicopter activities held the threat of midair collisions, exacerbated by fact that Army and Air Force traffic normally used different radio frequencies often mandated by different aircraft radios. The worst midair collision of the war claimed twenty-four U.S. lives on October 3, 1968 when a C-7 Caribou and a CH-47 helicopter collided over a forward strip at Camp Evans.[143]

---

[142] Nelson, interview, 20-21.

[143] Hobson, *Vietnam Air Losses*, 164-165.

The configurations of many forward airfields presented unique and dangerous aviation hazards. Several pilots recalled one extremely challenging strip midway between Saigon and Nha Trang. "There was one called Bao Loc which was across the back of a ridge, across the backbone of a ridge, and it was a steep approach, you'd come in and down into this kind of a canyon, gorge, and then you'd have to add power and climb and you'd be climbing when you touched down." After touchdown, the aircraft ran uphill, decelerated to the midpoint, then crested the runway in the middle, and then ran downhill to the end.[144] David Vaughan categorized the runways in Vietnam as either "challenging," "interesting," or "MAC runways." (for long easy runways suitable for Military Airlift Command "MAC" crews who operated the large long-range cargo aircraft), but he observed that the "abnormal runways had abnormal numbers of accidents associated with them."[145] That Vaughn denigrated the easy landing fields as MAC runways indicates the pride and status he derived as an aviator from demonstrating his skills flying into and out of tough airstrips, a quality he saw lacking in the bigger long-range MAC crews.

The runway at Bao Loc and other, shorter fields posed one of the greatest challenges to airlift crews necessitating that large, heavy cargo planes be stopped in very short distances. Pilots new to the theater were often surprised, and intimidated by the short fields their aircraft were required to land on. Wreckage of unsuccessful landings reminded crews of the challenges posed and the consequences of inexact airmanship: "periodically somebody would lose control in a bad crosswind on a short runway, and the next time you went into that field there would be this pile of burned rubble and a tail sticking up out of it. Tails never burned but everything else did."[146]

---

[144] Jackson, interview, 51.

[145] Vaughan, "Flying the C-130 Hercules in Vietnam," 76; Vaughan, *Runway Visions*, 107.

[146] Jackson, interview, 40.

Superb and precise aircraft control and exacting crew coordination were essential in successful short field operations because there were only a few seconds margin getting a 140,000-160,000 pound aircraft stopped on a short dirt strip. With such slim margins, good crew coordination was essential. Following a precise touchdown within the first few feet of runway, the flight engineer made a quick check of engine status before the pilots could reverse the pitch of their props to add reverse thrust to aircraft braking. As the aircraft slowed, the pilots swapped aircraft control between them so that the aircraft commander could grasp a second steering wheel needed to steer the aircraft on the ground. The margins for error mandated pilot skills, aircraft performance, and crew coordination at peak. When John Nelson came down final with two engines out at An Hoa, he knew they would exceed the margins for safety (because reverse thrust with both engines out could spin an aircraft off the runway to the side) and could only hope for the best because they had no alternatives but to put the aircraft down at An Hoa. "We knew going in that we would not be able to stop on the runway. We were going to run off the end of the runway."[147] Even under normal circumstances, David Vaughan wrote: "To make a good assault landing consistently was the goal of every fledgling C-130 pilot, and the instructor pilots who demonstrated the maneuver to us were held in high esteem. Well executed, the assault landing was as smooth as any 'grease job' one could make on a long, wet runway. Poorly executed, it was a teeth rattling, torso-wrenching, wing-warping, tire-busting experience, an unnaturally violent contact between airplane and earth, an event the participant wanted never to witness again."[148]

In addition to good crew coordination, pilot proficiency and solid aircraft control were "make or break" items needed to complete a successful short field (assault) landing. Young C-

---

[147] Nelson, interview, 20-21.

[148] Vaughan, "Flying the C-130 Hercules in Vietnam," 75.

130 pilot David Vaughn feared he would be unable to master the control needed to execute a successful assault landing. In the midst of his first try at one as a new copilot in South Vietnam he fell behind the aircraft. "As I rolled the wings level on final approach, I began to feel something like panic rising in me. I felt as if I had no control. It was the aircraft that was heading in to land, not me." The landing was little more than a controlled crash and required his instructor's intervention to save. "The aircraft was bouncing and careening down the runway, but at least it was on the runway. My heart was pounding. I wondered if I was hyperventilating. The landing was bad." Vaughan knew his inability to control his aircraft jeopardized his aspirations to upgrade to aircraft commander and his entire future as an Air Force pilot. "I knew in my heart that I had fucked up royally. I wondered whether I might not have earned for myself the unenviable position of permanent copilot. I really wanted more than that out of my tour in Southeast Asia. But I could not, in all honesty, say that I had demonstrated the capability to be anything more." His personal quest in Southeast Asia then became one to master his apprehension and flying abilities to land the C-130 throughout Vietnam's primitive landing strips and to prove himself worthy to upgrade to aircraft commander and instructor pilot.[149]

Crew proficiency remained important once on the ground to load and unload quickly and efficiently at forward bases. Once on the ground, large aircraft became a lucrative target for insurgent mortar attack. Crews believed the longer an aircraft remained on the ground, the more likely it would be hit as insurgents could set up mortars and find the proper range. Crews called their transport planes on the ground "mortar magnets." Capt Nichol, a C-130 aircraft commander, described the destruction of his C-130 at Dak To in November 1967: "They'd just completed the unloading when the first mortar came in. It went over the airplanes about 50 yards and landed just

---

[149] Vaughan, *Runway Visions*, 39, 59, 61.

on the other side of the runway….the tenth round or something like that hit right aft of the crew compartment on top of the wings on my aircraft and, of course, started the fuel on fire." He described his aircraft as "a complete loss. It's even hardly recognizable as an aircraft. It's completely burned."[150]

The vulnerability of aircraft at forward strips put a premium on makeshift repairs "on the spot" because an aircrew waiting for a repair crew or parts overnight stood a chance to lose their aircraft. Pilot Gerald Prather used a broomstick handle at an austere strip to plug the leak from a bullet hole in his C-130 until the aircraft could be properly repaired.[151] C-130 pilot Frederick Nyc's engineer crawled out on the wing with the aircraft first aid kit to successfully coax a balky engine to start. When he got back on the flight deck, he explained "I put a Band Aid on the speed sensitive switch to hold it closed until we reached thirty-five percent. After you gave me the signal, I used my shoestring to pull the Band Aid off" which gave Nyc the occasion to muse "It is amazing the ingenuity that can spark in times of need. You would never [then] convince me that I didn't have the most outstanding engineer in the wing."[152] C-130 crews would "buddy start" balky engines by using the windblast of another aircraft to spin the propeller of the malfunctioning engine, and in extreme situations, crews might even elect to risk a takeoff on three engines.

Some landing zones required resupply while under fire or immediate threat of enemy fire. At the height of air landing operations at Khe Sanh, aircraft came quickly under fire as soon as they stopped. Crews adopted "combat offloads" where the loadmasters unlocked cargo pallets

---

[150] Capt Phillip D. Gritten et al., interview by Amn Mike Sheppard and SSgt Steve Sprague, April 1968, 4, Air Force Historical Research Agency, Maxwell AFB, AL.

[151] Prather, interview, 9-10.

[152] Nyc, *Blind Bat*, 143.

and lowered the cargo ramp while pilots accelerated the plane on the ground. Similar to pulling the tablecloth from under dinner plates, the pallets quickly dropped to the ramp as the aircraft kept moving. Once unloaded, crews paused briefly with the engines running to see if anyone began running from cover towards the aircraft. The crew would take them on board, close the doors and hatches and quickly depart. C-130 pilot Anthony Borra recalled a "challenging and tense" combat offload under fire at a Special Forces camp as one of the incidents he remembered most prominently from his tour, heightened by the urgent needs of the ground force, and by the precise crew coordination demonstrated in a quick and efficient offload.[153]

Fields that proved too short or too dangerous to permit an assault landing mandated more spectacular cargo delivery techniques. Two techniques allowed for low altitude drops of cargo as the C-130 skimmed a few feet above the ground. One technique, called low altitude parachute extraction (LAPES) required the pilots to fly down the runway at about five feet. In the rear of the aircraft, the loadmaster had the ramp open, and once over the runway the crew deployed a drogue chute that pulled the load free of the plane and then slid down the landing area, slowed by parachute. Lt Col John Ohlinger directed the resupply of an outpost at Katum northwest of Saigon near the Cambodian border. He observed the speed and flexibility of a LAPES drop solved the problem his resupply birds were having with antiaircraft fire. "This seemed to solve the problem and after the time we went into the LAPES method, we took no more hits. The reason why LAPES is so good in this type of environment is the fact that it offers the pilot all kinds of maneuverability. He [is] not exposed to a long, slow axis of attack. He can maneuver, twist, turn, come over at high altitude, let down very rapidly, get right down on his drop zone, release his

---

[153] Borra thought the most conspicuous act of bravery he observed took place on the ground when C-130 crews moved aircraft away from a burning aircraft damaged in a mortar attack. Interestingly, Borra took part in hazardous resupply drops in the A Shau Valley and witnessed an aircraft in his formation shot down and crash during the drop. Borra, interview, 76-77, 91.

load and get out of there." C-130 aircraft commanders had the opportunity to employ the C-130's maneuverability and power to mitigate some of the risk of ground fire, which appealed to their basic pilot preferences for freedom and flexibility. According to Ohlinger, on a LAPES mission, there is "very little slow flight, very little flight at altitude on a long slow axis of attack." The pilot "can exercise great judgment in assessing his approach and come in high, go down do the job, and get out of there."[154] This ability to maneuver appealed to the crew's desire to exercise their own control over the aircraft and mission, and to use their aircraft's full freedom and flexibility. The other technique, called Ground Proximity Extraction System (GPES) used a similar profile, but the crews used a hook attached to the cargo load to engage a cable strung across the landing zone and yank the load free of the cargo bay. Although this method gave more control over where the load landed, it required a heavy set of ground equipment to fly in and set up.

Parachute air drops provided a third method of delivering men and cargo over South Vietnam, suitable for locations away from airfields, or in threatened areas. Tactical air lifters conducted multiple small-scale paratroop drops early in the war, allowing rapid insertion of infantry into the field but large combat paratrooper jumps culminated in February 1967, when crews air-dropped a brigade of paratroopers into combat near the Cambodian border west of Saigon as part of Operation Junction City in a dramatic and high visibility operation featured on the cover of *Life* Magazine.[155] Airlift crews overcame poor weather and put the paratroopers on target in this biggest combat jump of the war.[156] This photogenic but disappointing operation

---

[154] Lt Col John F. Ohlinger, interview by Capt Richard B. Clement, December 5, 1968, 35, Air Force Historical Research Agency, Maxwell AFB, AL.

[155] "Battle Jump: New Tactics Step Up the War," *Life*, March 10, 1967, cover.

[156] Maj Henry M. Davis, interview by Col Ray L. Bowers, April 24, 1972, 4-7, Air Force Historical Research Agency, Maxwell AFB, AL.

failed to trap major insurgent units, which presumably slipped the cordon and escaped to Cambodia. After Junction City, some smaller scale paratroop drops took place but MACV made greater use of air landings with tactical airlift and helicopters.[157] Cargo drops, however remained important throughout the war, figuring prominently during the sieges of Khe Sanh and An Loc. Through a combination of ground radar, airborne radar, or visual references, tactical airlift crews located their release points to release their loads. Gary Jackson described a typical drop "you would approach over the drop zone at five or six hundred feet and open the ramp and door." While in the cargo bay, "these containers were stacked on small pallets, and at the appropriate moment you would accelerate and pull the nose up and they'd slide out the back and there was just about time enough for the parachutes to open and they would hit the ground"[158] Airdrop planning and accuracy were the navigator's primary responsibility. They estimated winds aloft to compensate for drift, and estimated a Computed Air Release Point (CARP) to hit the drop zone. Accuracy was important to avoid endangering friendly troops and to keep the supplies from falling into enemy hands. Alan Gropman's C-130 crew was preparing to abort their drop into the A Shau Valley because of low clouds when the copilot glimpsed a ground reference just prior to the drop zone. Gropman used this glimpse of a ground marker and his stopwatch to estimate a release point and put two loads within one hundred meters of the desired drop point.[159] Air assault, LAPES, and air drop missions were appealing to C-130 crews. Each had opportunities to use the flexibility inherent to flight and for pilots, it afforded them an opportunity to exercise their control over their aircraft in a challenging situation. Navigators applied their unique expertise in

---

[157] Bowers, *Tactical Airlift*, 135.

[158] Jackson, interview, 44.

[159] Maj Alan L. Gropman, interview by Col Ray L. Bowers, April 24, 1972, 5, Air Force Historical Research Agency, Maxwell AFB, AL.

airdrop planning and navigation to locate remote drop zones and accurately put their cargo on target. Flight engineers and loadmasters had important tasks to accomplish within each of these missions giving them a sense of importance as Air Force aviators. Airlift crews found an environment that gave them considerable latitude in applying their unique skills to the airlift mission.

"Doing What We Had Been Paid to Do," Tactical Airlift and Authority

Higher headquarters granted substantial autonomy to airlift crews to solve problems and accomplish their assigned missions with minimal interference. Unlike Rolling Thunder, the chain of command placed few obstacles in the way of crews focused on accomplishing the airlift mission; instead of frustrating airlifters (like the fighter pilots flying over North Vietnam), the authority delegated to crews was a source of motivation. Because of the primitive infrastructure and the immense scale of the airlift operation, intermediate level commanders at the wing, air division or numbered air force levels were unable to reach into scores of flight decks and dictate to the airlift crews. The top airlift generals in South Vietnam commanded the 834th Air Division and were responsible for the airlift assets in theater. Brig Gen William Moore and then Brig Gen Burl McLaughlin sought to achieve an efficient theater operation with maximum aircraft utilization, full payloads, and minimal ground time. They also accepted there had to be some flexibility with the rules to facilitate operations where air routes, landing fields, navigational aids, and weather reporting stations were lacking. When local disagreements arose at dispersed operating sites between aircrews and local commanders, the aircraft commanders regularly had the last word because aircrew safety was ultimately on the line. Frederick Nyc appreciated the trust delegated to him to get the job done. "A lot of the rules and regulations that govern the normal USAF stateside air operations more or less flew out the window. We got about the

business of doing what we had been paid to do for all of our Air Force careers. This is not to say that all of the training, good sense, and safety items were ignored, but it did mean that we had to do our very best to accomplish the mission despite the obvious dangers of flying into primitive locations." Nyc believed that the autonomy granted airlift crews motivated them to higher performance. "Although we never had a fly-at-all-costs policy, we did like to feel that we pushed ourselves in order to complete the mission."[160]

Authority, represented by Moore and his staff sought efficiency from a complex system. Commanders paid close attention to on time takeoffs and average payloads to gauge the efficiency of the entire operation. In Moore's words: "Keep the airplanes in the air, maximize the productivity, which is the flying, and minimize ground time. We tracked that very, very closely."[161] Attentiveness to performance statistics and efficiency was a central element in the Air Force's airlift culture. Lt Gen William Tunner led two theater-sized airlifts ("The Hump" in China-Burma-India and the Berlin Airlift), and wrote "the actual operation of a successful airlift operation is about as glamorous as drops of water on stone. There's no frenzy, no flap, just the inexorable process of getting the job done."[162] As they got the job done in Southeast Asia, airlift crews played a significant role in helping their commanders track the inexorable performance of the system. C-123 navigator David Hosley recounted that "We kept a very detailed record of tonnage carried per month and per day, and this was our big thing—how much tonnage of cargo

---

[160] Nyc, *Blind Bat*, 28.

[161] Moore, interview, 131.

[162] Tunner retired in 1960 as the chief of the Military Air Transport Service, the forerunner of Military Airlift Command (MAC). William H. Tunner, *Over the Hump* (Washington, DC: Office of Air Force History, United States Air Force, 1985), 163.

and how many passengers. We kept a very accurate count of that with a number of graphs that we had, and this was the big thing."[163]

Crews tried to adhere to schedules as closely as practical to keep the system running smoothly. Countless difficulties such as weather, mechanical difficulties, enemy actions, or just the interactions of a large and complex system inserted friction and caused delays, breakdowns, and inefficiencies. A flat tire, a fog layer, or an urgent resupply request routinely threw off the daily timetable. C-130 pilot John Ohlinger observed during a ground tour running an airlift operation on the ground at a forward strip that "blown tires, of course, [were] one of the primary maintenance difficulties that could really stop an operation, especially if the airplane blew a tire on the runway. You had to discontinue the whole operation until you could get the tire replaced and the airplane moved off the runway."[164]

Airlift commanders expected crews to find local solutions to get their missions done. Airlift operated in scores of locations throughout the theater and limited communications precluded centralized control of day to day execution, so commanders granted tremendous autonomy to airlift crews. Brig Gen McLaughlin reminisced that "our most effective job in Vietnam, with tactical airlift, were the simplest things, utilizing what you had at hand. Just have some guy that was smart enough, had energy enough, initiative to figure out here's the requirement, here's what I've got, here's the way we'll do it." He assessed that local innovations led to the success at Khe Sanh when poor weather inhibited landings and visually guided air drops. "We had radar on the ground…and radar in the airplane. If we could get a fix, a known fixed position in space, then we could stopwatch time because the navigator had his winds, he

---

[163] Hosley, interview, 5.

[164] Ohlinger, interview, 15-16.

knew exactly what the headings should be, exactly what the timing should be, and 99 percent of 8,000 tons [was] dropped in a 300 by 300 yard DZ [drop zone]."[165]

For large operations, the 834th Air Division designated senior aircraft commanders as temporary on scene mission commanders to oversee airlift at remote airstrips and to expedite operations in the field. Lt Col John Ohlinger served as a mission commander and enjoyed considerable autonomy. He observed that higher headquarters involvement was "nonexistent" at his forward landing strip. "This was well that it was this way. In this type of operation, there are very few hard and fast, firm guidelines or rules that can be set down….You have to take the problems as they arise and using experience and judgment, [make] a determination and go ahead on that basis."[166] Aircrews welcomed this autonomy in that they gained tremendous satisfaction in finding their own solutions to mission challenges. C-123 pilot Charles Borders observed that most aircrews "gained great satisfaction" from a system that relied on on-the-spot decisions, although former SAC crew members, accustomed to operating under close control were unaccustomed to autonomy.[167]

Trust and an implicit understanding that innovation sometimes required bending the rules contributed to a decentralized tactical airlift philosophy, but was a risky command philosophy. C-123 pilot Richard Kimball observed early in the war that "We 'bent the rules' when necessary to accomplish the mission, if the cargo was of sufficient importance….[and] commanders encouraged this by doing the same thing themselves in the air. The crews believed they would be

---

[165] McLaughlin, interview, 6.

[166] Ohlinger, interview, 6-7.

[167] Col Charles W. Borders, interview by Col Ray L. Bowers, November 4, 1970, 4, Air Force Historical Research Agency, Maxwell AFB, AL.

backed up by their leader if a reasonable calculated risk led to an accident."[168] A flexible attitude towards flying regulations created a permissive atmosphere that placed the mission first, but could place aircrews and their commanders on a slippery slope if they could pick and choose which normal flying directives applied and which did not (and when they applied). Aircrews policed themselves through mutual surveillance and objected internally to unnecessary dangerous activities, but occasional excursions beyond necessary or reasonable risks took place within Southeast Asia's permissive environment. A C-123 crashed early in the war because of a gross lack of flight discipline when the crew attempted to fly low and snag a bamboo pole flying a pair of panties near the runway at Nakon Phanom, killing all on board.[169] The flexible attitude towards the rules and lack of supervision mandated that crews had to exercise strong flight discipline to keep their operations safe. John Nelson sensed the need for extra vigilance regarding the loose rules in Southeast Asia. "What I had to adapt to in Southeast Asia was to be able to put up with the monotony of everything and still be alert and not be a sloppy pilot. You could do anything you wanted to over there. You could do some dangerous things too, which could result in getting killed or the airplane lost or whatever else. It required a lot more self-discipline, because there was not nearly the supervision in Vietnam as there was anywhere else. You were just expected to do your thing."[170] This type of flight discipline was normally enforced top-down, especially in the regulations-conscious SAC. Within the tactical Airlift community, it was imperfectly self-imposed and enforced to help manage the risks of flight over South Vietnam.

---

[168] Lt Col Richard D. Kimball, interview by Ray L. Bowers, November 4, , Air Force Historical Research Agency, Maxwell AFB, AL.

[169] Bowers discreetly described the object as a "red flag mounted atop a fifty-foot pole." John Hodgin, interview by Dr. Richard Burks Verrone, February 3, 2003, 34, The Vietnam Archive, Texas Tech University; Bowers, *Tactical Airlift*, 124-125.

[170] Nelson, interview, 34-35.

Commanders had an obligation to minimize aircraft mishaps, but as noted, unit commanders were largely absent from the scene in theater. Their normal watchdogs were standardization-evaluation crews who administered flight checks, enforced regulations and served as the commander's eyes and ears. SAC's standardization-evaluation crews were the Air Force's most stringent, set the strictest and highest standards, and allowed no imperfection to go unnoticed (and will be discussed in depth in the section on Arc Light). Airlift memoirs and oral histories paint a more relaxed attitude among airlift standardization aircrews, whose efforts centered on aircraft systems knowledge and in-flight proficiency. Even evaluators could be seduced by the open skies of South Vietnam. After a long day of administering check rides on David Vaughan's aircraft, an evaluator asked "how about if I fly it for a while? I don't get to fly much doing these evaluations all the time." Vaughan assented, but was shocked when the evaluator broke multiple flight regulations by buzzing the wave tops off the coast. "Lower and lower he took us, until we were practically on the water. Our props were kicking spray up on the windows. I couldn't believe what I was seeing. This guy had the nerve to endanger an entire crew….As if we didn't have enough ways to kill ourselves."[171] Although this incident is an isolated and unusual one, it underscores the potential dangers created by a permissive attitude towards picking and choosing flying directives.

There were occasional (and more common) disagreements between aircrew and authority where aircrews had to resist an overly zealous mission focus by higher authority. Gary Jackson believed detachment commanders in theater "had different priorities" and were less concerned about safety than they were about crews making their scheduled takeoff times. "I think is what they were graded on." He was frustrated by the fatigue caused by the rotating flight schedule.

---

[171] Vaughan, *Runway Visions*, 161-163.

"Exhaustion got to be one of the hazards we had to deal with….But commanders kept scheduling us to fly." Although Jackson was happy to have the decision-making autonomy he was granted as an aircraft commander, he thought the primitive flying environment and relentless flying schedule generated conditions that were conductive to accidents. "Sooner or later somebody would have a crash, and then it would be his fault. There would be an investigation, and there would be letters posted on the bulletin boards that aircraft commanders were supposed to evaluate the situation and evaluate the condition of their crew and not fly into a situation from which they could not recover, and if they did it was their fault. That always irritated me."[172] When disagreements surfaced, and C-130 aircraft commanders stood their ground, they normally prevailed against higher ranking officers because their own safety was on the line. The most common disagreements concerned overweight cargo loads. Ground commanders wanted to minimize their airlift sortie requirements and overloaded pallets and vehicles designated for an airlift mission. Loadmaster Kenneth Kruger suspected a load of armor plating was well overweight and refused to load it in spite of protestations from more senior noncommissioned officers from the aerial port personnel, an Air Force lieutenant, and an Army full colonel. As Kruger stood his ground against a very senior officer, his aircraft commander had the final say with the Air Force lieutenant in charge of the aerial port: "this lieutenant comes back and the lieutenant says, 'You are going to carry this load,' and the captain [aircraft commander] went up and grabbed him right by the shoulder and he says, 'Look, you don't have to crash and burn in this airplane, so you just get your ass out of here.'" Kruger and his crew took only part of the load which they later found was still over the maximum allowed by their C-130.[173]

---

[172] Jackson, interview, 43.

[173] Kruger, interview, 32; Nelson, interview, 23-24.

Tactical airlift crews were unique in the degree of autonomy the chain of command afforded them. Tactical airlift missions were the least restrained by higher authority and aircraft commanders and their crews set most of their own limits. This autonomy was immensely satisfying to aircraft commanders who trained their entire careers to make decisions, and Vietnam gave them the opportunity to do "what we had been paid to do," in the words of Frederick Nyc. When they exceeded normal peacetime limits and got away with it (as was normally the case countless times every day in Southeast Asia), the mission got done and little was said. Some of the war's sixty-five USAF airlift accidents, however, were likely to have been enabled by this relaxed attitude towards the flying rules.[174]

Motivation: "You Almost Wanted Things to Happen to See How Good You Were"

The appeals of flight attracted the Air Force's tactical airlift crews as powerfully as their peers assigned to other aircraft types. Although most enlisted aircrew were often not initially motivated to enlist in pursuit of flying opportunities, they enjoyed many aspects of flying as much as their rated officer partners. All crew members were strongly motivated by the ability to apply their unique expertise to complete challenging missions, and were bolstered by the fellowship and sense of belonging they felt as part of a crew. Tactical airlift crews were motivated in combat by confidence in their abilities as aviators, which gave them a sense of control over the risks of combat through their own expert airmanship and decision-making. Connections to other combatants and a sense of personal honor and pride further motivated crews to perform their duty. These airmen were sustained by the enjoyment of flying a variety of challenging missions which

[174] The USAF lost twenty-one C-130s, thirty-two C-123s, and twelve C-7s to accidents during the war. Bowers, *Tactical Airlift*, 689.

gave them the opportunity to prove themselves as aviators and contribute as an essential part of a team.

Tactical airlifters felt the same initial motivations common to other aviators of their generation. Like the fighter pilots flying in Rolling Thunder, the allure of flight attracted most tactical airlift pilots and navigators from an early age. Although the C-130 did not initially attract many students in undergraduate pilot or navigator training, the men assigned to fly it were quick to point out the virtues and unique attributes of their aircraft with pride once they became familiar with it. Anthony Borra missed his desired fighter assignment by one slot, but saw that in the C-130 he would "get to go more places, and I would get to upgrade a lot sooner to aircraft commander, which is what you want to be doing" compared to his peers assigned to F-4 backseats.[175] After some flying setbacks in T-38s, Gary Jackson lost some of his confidence during the latter half of pilot training, but "by the time I finished that first fifty hours [in the C-130], I had my confidence back, and I really, really, liked the airplane." He pointed to the C-130's varied missions, its power and reliability.[176] Other flyers, as already noted, were favorably impressed by the C-130's powerful engines, its agility, and the control they could achieve over such a large aircraft which appealed to an aviator's natural affinity for power, control, and freedom.

Many tactical airlift flight engineers and loadmasters enlisted in the Air Force to pursue non-flying interests but acted on opportunities to fly after their first term of enlistment. Many cite an interest in airplanes or mechanical inclinations that initially pointed them towards the Air Force. During the Vietnam War, the Air Force relied on volunteers and did not need to draft

---

[175] Borra, interview, 35-36.

[176] Jackson, interview, 26-27.

young men to fill their enlisted ranks as other services did. Because they believed the Air Force offered relatively safe duty, many young men enlisted in the Air Force to avoid ground combat.[177] Sgt Timothy Lockley flew as a C-130 crew chief and recalled joining the Air Force in 1966 because he was sure he would be killed in the infantry. "I didn't mind serving my country but I'll be damned if I was going to die for it."[178] Most C-130 enlisted aircrew started in aircraft maintenance. Vaughn Shirley stated: "I got into flight engineering by doing my three years of allotted service as a wrench bender. You have to perform maintenance on the aircraft and learn the systems; and then if they feel that you are technically competent and can handle the renewed stress of flying, they allow you to become a flight engineer."[179] Flight engineer Gary Knecht decided to act on an opportunity to fly: "I didn't really know what it entailed....I had been sending them off and working on them, I just thought I would try the other end of the stick."[180]

Although the antiwar movement was a vocal element of American public discourse in 1968 and gave some aviators pause to consider the morality of the war, it did not dampen the willingness of many aviators to fly in Vietnam, who saw flying as an adventure or a test of their skills. Tactical airlift crews found their participation in the war untroubling because the airlift

---

[177] *Winged Shield, Winged Sword: A History of the United States Air Force* (Washington, D.C: Air Force History and Museums Program, United States Air Force, 1997), 300.

[178] In Lockley's words, "[my father] was a Marine and I was raised to be a Marine. I was born on November the 10th, that's the Marine Corps' birthday…the last six months of high school my father had the recruiter over at the house every Friday night for supper." But fear of the infantry led Sgt Lockley to sign with the Air Force. Upon return from the recruiters, his mother asked him "why'd your father let you join the Air Force?' I said, 'He didn't.' 'Well, how'd you get in, you're seventeen?' 'Recruiter said you could sign the papers.' She snatched them out of my hand and signed them on the pickup truck, right on the hood and it was literally a couple of years before my father would talk to me." Timothy C. Lockley, interview by Dr. Richard Burks Verrone, February 11, 2003, 5-6, The Vietnam Archive, Texas Tech University.

[179] SMSgt Vaughn Shirley, interview by Lt Col Judd Katz, February 6, 1992, 5, Air Force Historical Research Agency, Maxwell AFB, AL.

[180] Knecht, interview, 13-14.

mission seemed distant from much of the war's violence. Gary Jackson recounted that he and another new C-130 copilot "questioned whether what we were doing in Vietnam was what we should be doing, and how we were going to react." But he saw combat flying as an adventure that overrode his personal doubts or objections. Although "television shots of burning down hooches" affected him, he remained committed to his future combat role. "There wasn't any question we were going to go….I was kind of eager to get over there and see for myself." His partner also remained committed to fulfilling his combat responsibilities by focusing on the flying challenges and falling back on an aviator's drive to perform to his utmost to satisfy internal motivations. "The way he got over it was he decided that he would just concentrate on the job, and become as good a C-130 pilot as he could and do everything the best he could and not think about whether it was right or wrong." During Jackson's two-year tour in Taiwan, he flew with one young navigator who initially told their squadron commander that "I don't believe in what we're doing, I don't want to fly combat missions." The commander emphasized the C-130's supporting role and sent the navigator on a combat rotation to Vietnam. "You know the things we do over here are not, we don't drop bombs, we don't set things on fire, we don't blow things up. We haul cargo and we evacuate wounded, we evacuate refugees. Why don't you just go down there and fly for a little bit and then come back and talk to me." After his initial experience with the unit mission he "served his year over there" because "it wasn't anything he objected to."[181]

Airlift crews experienced a more graduated and insulated transition to war-time flying compared to their single-seat F-105 peers in Rolling Thunder. A C-130 crewmember's initial exposure to combat flying took place under the watchful eyes of an instructor while flying as part of the crew. Although newcomers were often overwhelmed by the new environment, and

---

[181] Jackson, interview, 30-31.

intimidated (recall that Gary Jackson had remarked that at first "my seat could have been vacant and they would have been okay"), close supervision enabled them to overcome inexperience and lack of confidence. David Vaughan's poor initial showing and fear of assault landings were mitigated by a patient but demanding instructor pilot: "'You're high. Better start your descent,' Passarello advised…. 'Get the nose down!' Passarello demanded…. 'Too fast! Too much airspeed' Passarello yelled."[182] Richard Marks recounted a copilot who froze the first time he came under fire, but because he was part of a crew, the others on the flight deck compensated. "That was the first time I can recall getting shot because I could look up and see tracers coming up, like a garden hose does.…We were on final landing and the copilot froze. I think I reached over and put the gear down and the flaps for the pilot" by moving from his navigator's position. "We never flew with that guy again," and he was assigned to another crew.[183] Those few who found their courage wanting, even as part of a crew, were able to find refuge from combat rotations as part of a headquarters staff.

The C-130 organizational structure afforded some opportunities for aircrews to avoid combat flying over South Vietnam. Just as in Rolling Thunder, the greater the distance one was from actual combat flying, the easier it became to avoid combat. Because C-130 squadron and wing staffs were based outside South Vietnam, there was the potential for crewmembers to occupy staff positions, avoid assignment to a regular crew, and minimize combat exposure. Myron Everton recalled one pilot at his base who "just lost his gut for it and they had to give him another job in the squadron that didn't involve flying in Vietnam. He couldn't hack it." He assessed that "one or two others" actively sought "jobs back on the islands that would keep them

---

[182] Vaughan, *Runway Visions*, 37-38.

[183] Marks, interview, 31.

from going into Vietnam" but these aircrew were rare exceptions to the norm.[184] Even during toughest combat, once an aircrew member was in theater and assigned to a crew there were few opportunities to avoid combat flying. Amidst the 1972 Easter Offensive, which saw the loss of three C-130s during the siege of An Loc, the 347th Tactical Airlift Wing commander encountered only one combat refusal.[185]

The predominant attitude among C-130 aircrew members was a desire for assignment to a regular crew (regularly rotating into theater) over a staff position. Assignment to a permanent crew provided an aviator with physical and psychological support of close peers. Crews developed a strong sense of camaraderie and derived motivation from belonging to a close-knit cohesive peer group. When David Vaughan was detailed to a month of non-flying duty at Cam Ranh Bay, his first thoughts went to his crew. "My heart sank. Going to Cam Ranh for a month meant just one thing: I would lose the crew I had been flying with. And who knew what the crew situation would be in a month's time?"[186]

Tactical airlift crew's allegiance and identity were to their five-man crew rather than flight, squadron, or wing. Crew-members assigned to a permanent crew developed a powerful sense of identity, while those who bounced from one crew to the next yearned for assignment to a permanent crew. Crew members rotated into the theater together and spent ten to sixteen days together on the road. The C-130's rotating daily schedule kept each crew on its own unique schedule and isolated them from the others. Once in the air, their duty stations in the aircraft

---

[184] Everton, interview, 34-35.

[185] During the heavy fighting around An Loc in 1972 one loadmaster (who had honorably completed a hazardous tour with UC-123 spray aircraft) balked at flying into the siege of An Loc where PAVN guns downed three C-130s between April 18, 1972 and May 3, 1972. Brig Gen Andrew P. Iosue, interview by Col Ray L. Bowers, March 27, 1975, 2, Air Force Historical Research Agency, Maxwell AFB, AL; Hobson, *Vietnam Air Losses*, 222-223.

[186] Vaughan, *Runway Visions*, 96.

physically bound crews together; once underway, their fate was a shared one. Navigator Steven Katz believed the crew relationship as an aircrew defined his Air Force experience: "I will say that probably the best experience I ever had in my life was being an air crew member, not specifically in Vietnam but just generally." He recalled learning how to get along with officers and enlisted airmen, and after ten days together on trips to South Vietnam, built "an awfully good relationship"[187]

Other affiliations paled in comparison to crew membership. When crews arrived in South Vietnam on a two-week rotation, the local leadership at South Vietnam's airlift hubs performed little more than a scheduling function, aligning crews with aircraft and the daily flying schedule. Senior officers attended to problems that affected the efficiency of the daily operation, but otherwise, crews were on their own. Gary Jackson observed that "when we were in Vietnam we were under the operational control of commanders there and they had different priorities. Where our commander at CCK [Ching Chuan Kang Air Base, Taiwan] was responsible to deliver us in good health and properly trained and safe, the commander in country was not responsible for that, he was responsible for getting missions hacked, and so he was less concerned about whether we did it safely, unless we screwed up."[188] John Nelson was a C-130 aircraft commander and described the lack of higher leadership while deployed: "In Vietnam the Colonel that was really ultimately in charge of me there in Vietnam didn't even know me. I was just a number to him." Local commanders in Vietnam never had the time or opportunity to get to know the crews. In the eyes of the deployed commanders, "all the crews were pretty much equal. There wasn't a good

---

[187] Katz, interview, 40-41.

[188] Jackson, interview, 62-63.

crew and a bad crew. They tried to give the inexperienced crew the easier missions. They were pretty much filled in a square."[189]

Because of the constant rotation in and out of theater, aircrews had minimal ties to their squadrons and leaders back in the Philippines, Taiwan and Okinawa. Crews spent only a few days at a time in their own bunks between trips to Vietnam or other airlift routes in the west Pacific. Gary Jackson saw crew autonomy as a positive aspect of his tour: "we were away from home so much that we didn't really have a lot of dealing with our [squadron and wing] staff at home. One thing I loved about flying C-130s was you were out on your own, kind of autonomous a good bit of the time."[190] As a C-130 loadmaster, Ken Kruger missed the closeness of his previous SAC air refueling squadron "with our own individual crew we were pretty close, but it was nothing like the in-flight refueling squadron." Kruger thought the TAC commander, Gen Walter Sweeney, undermined squadron identity: "he made us get rid of all our squadron patches and put the TAC patch on the airplanes and TAC patches on our uniforms, so instead of being a member of a small group, now you're a member of this gigantic tactical air command, which you could have cared less about."[191] Squadron commanders had little opportunity to form unit identities since their crews were never home at the same time, and he only saw each crewmember a few days a month, if at all. Donald Davis was unimpressed by his squadron commander because they had very little contact. "The most senior of those Lieutenant Colonels [in the unit] was the Squadron Commander. I hardly ever saw him. He had a job doing what he was doing." Davis never had the

---

[189] Nelson, interview, 34-35.

[190] Jackson, interview, 62.

[191] Kruger, interview, 28.

opportunity to observe his commander in combat, if he deployed from their home base because of the fragmented crew scheduling. "He was never in country with us… He was always at CCK." [192]

Crews experienced strong support from their crewmates, but an internal desire to fly provided underlying motivation. An enduring attraction to the joys of flight sustained the motivation of many tactical airlift crews. From the air, the heat and discomforts of life in Vietnam faded away and Vietnam became beautiful and pleasant. Loadmaster Ken Kruger observed that "it was one of the prettiest places I have ever seen in my life…it's very green…but then had the whitest beaches that you ever saw and then this emerald green water." He thought "this place is beautiful, until you get out of the airplane."[193] John Currey enjoyed the freedom he experienced in the air weaving between the cloud tops in his C-130. Unlike other lower and slower transports, the C-130 could climb above the weather "and you'd fly around in the beautiful weather up there and fly around the tops of clouds instead of having to plow through them which made it just really fun to fly." [194] Aircrews enjoyed flying, and airlift tours in Vietnam gave them the opportunity to fly a lot; crews could accumulate between four and five hundred sorties in a year-long tour.

Challenging aviation situations, like tight assault landings or poor weather, offered crews the opportunity to prove themselves and validate their flying skills. Although David Vaughan arrived in theater as a qualified C-130 aircraft commander, the unique challenges of flying in Vietnam tore up his self-confidence and led him to question his abilities as a pilot. "The idea of plumping this high-wing cargo aircraft onto a dirt strip and making a panic stop was foreign to

---

[192] Donald Davis, interview by Dr. Richard Burks Verrone, March 6, 2003, 33-34, The Vietnam Archive, Texas Tech University.

[193] Kruger, interview, 23.

[194] Currey, interview, 10.

everything I had learned in my previous flying experience…I heaved a deep sigh. How would I ever be able to execute such an unusual and demanding maneuver?" Despite some initial missteps, Vaughan mastered the aircraft, executed precise control over it, and earned the opportunity to lead his own crew. Less than a year into his tour, Vaughan reflected back on his growth in confidence and flying ability. "It didn't occur to me until later that we had landed with a full load of troops on a very small runway in visibility that was less than an eighth of a mile and a ceiling that was less than a hundred feet. If someone would have told me one year prior that I would have been making the kind of landings I was making, flying into the kinds of fields I was flying into, I would have shaken my head in disbelief."[195] John Nelson found excitement in the test of combat flying. "To me I was young and it was exciting. It was routine in that we had become extremely good pilots." He believed his ability to control his aircraft validated his pilot skills, and the challenges of flying in South Vietnam made him an even better pilot. "We could land the airplane anywhere, and any emergency we could handle. Sometimes, you almost wanted things to happen to see how good you were. We were good. That was really it."[196]

Opportunities to apply their unique skills to accomplish otherwise impossible missions motivated airlift navigators. Locating airstrips, and drop zones under difficult flying conditions gave navigators an opportunity to validate their navigational expertise and proficiency. Alan Gropman took great professional pride in finding a way to get his aircraft and crew through the low ceilings and past the PAVN's guns down into the bottom of the treacherous A Shau Valley and then placing two airdrops within seventy and one hundred meters of their desired impact point. Richard Marks took pride in directing his crew through airborne radar approaches that

---

[195] Vaughan, *Runway Visions*, 24, 159.

[196] Nelson, interview, 26.

required fast and precise reactions. "We would talk the pilot down…you had to pick out the runway and you had to give him the right heading to kill drift and set the right descent all at the same time." When Marks encountered the wounded soldier on the ramp at Pleiku, Marks' aircraft commander made the decision to go based on his trust in his navigator's radar interpretation skills. "He trusted me because…it was my ability to let down through all that stuff and find the runway."[197] Marks derived satisfaction from the expert application of his unique navigation skills to complete a mission that he considered important, but would have been impossible without him. The crew trusted their lives to Marks' skills which he applied to the situation expertly. Although "we were so nervous we couldn't light a cigarette" after the mission, he assessed that one event made "the best mission I ever flew in my life."[198]

Enlisted aircrew also enjoyed the opportunity to contribute their expertise to the mission. Flight engineers ensured the aircraft was ready to go after performing careful preflight checks. In flight they provided their systems expertise to inform the crew of the aircraft condition and solve aircraft systems problems. Similarly, loadmasters ran the activities in the cargo bay, configuring the aircraft for different missions and securing the people and cargo. Their weight and balance calculations were critical to successful takeoffs and landings. Enlisted flight crew members enjoyed special status as flight crew members, signaled by the flight suits they wore on duty which contrasted with the rest of the enlisted force's green fatigue uniforms. Ken Kruger cross-trained into C-130s as a loadmaster from SAC KB-50 tankers because the aging KB-50 force was closing down. He thought "Gee, I don't want to get grounded, I love flying."[199]

---

[197] Marks, interview, 34-35.

[198] Ibid., 25, 35.

[199] Kruger was ultimately dissatisfied by his decision to cross train into TAC C-130s because his peers were able to stay in SAC as enlisted boom operators where promotions were more frequent and they spent less time on the road on temporary duty. Kruger, interview, 14-15.

All believed that their skills helped the entire crew to survive in combat. The day-to-day experience of flying tactical airlift in South Vietnam appeared to present manageable risks, and aircraft commanders were wise to use the crew's expertise to minimize the risks of enemy fire and the hazards of flight in South Vietnam's limited infrastructure. Gary Jackson did not think about being hit. "Every pilot I ever knew [thought]…it might happen to somebody else but it can't happen to me." This enabled him to put fears out of his mind "because when you [are] armed with that kind of armor, that's not one of the things you worry about." By putting fears of enemy action aside, he was able to focus on avoiding the risks inherent to flying in South Vietnam. "The things that stressed me were making right decisions, going the right place at the right time, not landing at the wrong field, not putting on too much fuel or not enough fuel or running out of fuel, or running afoul of some regulation somewhere."[200] C-130 aircraft commander Myron Everton thought taking a small arms hit was a matter of luck, but never took any hits and stressed his own decisions and flying skill in avoiding small arms. Unlike the fighter pilots in Rolling Thunder, commanders gave airlift crews wide latitude to exercise local control. "I never came in below three thousand feet 'til I was over the field. Then I just throttle back and do a big sweeping turn down and land. When I was taking off in that sort of situation, I never take off straight ahead and hold it straight ahead…So that was my way of trying to deal with it."[201] John Currey thought the hazard of flying in uncontrolled airspace (without air traffic control) was the most memorable aspect of flying in South Vietnam, but he used the different skills of his crew to mitigate the risks. He used his copilot to fly on instruments after a disorientating night takeoff from the hump-backed runway at Bao Lac, and used his navigator to steer them through the

---

[200] Jackson, interview, 41.

[201] Everton, interview, 36-37.

clouds at Khe Sanh. "Once we took off and we were in the clouds, we didn't know where the mountains were so our navigator was very useful in that particular thing because he could pick the mountains out on the radar…. He did it very successfully. So it was very much a crew oriented team approach to flying there."[202]

In dangerous situations, most crewmembers became too involved with completing their flying tasks to feel scared. Like the pilots in Rolling Thunder, their immediate flying duties—the technical aspects of his job—consumed their attention. Anthony Borra saw considerable excitement as part of the initial assault air drops into the A Shau Valley in April 1968. As part of a formation of C-130s that braved low ceilings and deadly thirty-seven millimeter antiaircraft guns, Borra recalled that "you realize you're seeing puffs of smoke and you realize people are shooting at you, but you're busy. I guess that's one of the things about being aircrew. I don't know what it was like for the engineer who's just sitting there watching. I was always busy with the airplane or my duties because when you're at lower altitude, you're definitely busy." He saw one of the C-130s in formation take a hit and try to make an emergency landing in the valley but "the airplane exploded and was just gone." His flying duties left no time for reflection: "it was horrible, but you were too busy and we were getting ready to air drop and I had to get back to what we were doing. We were in a stream of planes flying up the valley."[203]

Borra's flying duties kept him busy, but the momentum of the mission and his place in formation (the "stream of planes") also held Borra and his crew to their air drop. The physics of flight contributed to their mission completion, because on an air drop (and any flight) there is no way to stop. Borra had to press on forward because they were in a narrow valley as part of a

---

[202] Currey, interview, 21, 31.

[203] Borra, interview, 72.

formation. They could not stop and they had nowhere else to go but over the drop zone. The presence of other aircraft and the sight of other men, performing their duty, activated aviators' tendency to continually compare their performance to their peers and strive to perform their best in front of them.

Performing well in front of fellow aviators was a source of honor and a spur to action. Conversely, failing to perform as well as others motivated airlift crews to avoid shame. On a routine airlift mission, David Vaughan arrived over the bowed runway at Bao Lac but found two other C-130s circling overhead waiting for the morning fog to dissipate. The center of the runway was visible, but fog still blanketed both ends. After substantial holding, one aircraft commander exclaimed "What the hell" over the radio to the other aircraft "I'm going to land!" and made a dangerous blind landing in the fog. The second C-130 dutifully followed suit, which pressured Vaughan to follow in a maneuver he considered dangerous: "Well, I thought, if they can do it, I can too." After a harrowing landing he mused "Dave and Denny and I and our crews, we did it. I think about it now, and I shake my head." Months later Vaughan followed another C-130 thorough a small glory hole into Khe Sanh. "We dropped down through the hole on a heading for Khe Sanh, committed now whether we liked it or not." Vaughan thought he was compelled to continue by the examples of his peers, and his pride pushed him on. "Once again I found myself led onward by the immutable in-country law: if the aircraft in front of us had made it, we could too."[204]

Airmen from most aviation communities felt a strong sense of obligation that stemmed from the power of their aircraft and an aviator's ability to control and direct that power to support fellow combatants. One might assume tactical airlift crews would feel a strong compulsion to

---

[204] Vaughan, *Runway Visions*, 118-120, 144.

fulfill their airlift mission to support the Army in Vietnam, but memoirs and oral histories yield little evidence of this sense of duty while performing routine airlift missions ("trash hauling"). Long flying days with many short missions and rapid loading and unloading of cargo tended to diminish the importance of any one mission, and the routine rank little mention. Exceptional missions that involved dire situations increased a crew's interest, motivation, and willingness to accept risks, especially when some form of a personal connection was established with the men being supported. With greater connections to the man or mission, crews could be willing to take more risks. Richard Marks' crew made a significant connection with one individual, the wounded soldier at Pleiku and took a risk so great, Marks was unable to light a cigarette after the flight. John Delmore illuminated a more generic connection to fellow American combatants endangered at Kham Duc for his C-130 crew before their rescue attempt there. In the words of loadmaster John McCall, "he told the crew that Americans were on the ground there, and had it been us, we'd expect someone to get us out."[205]

Airlift crews found rewards in the exercise of their unique aviation skills and enjoyed using them to accomplish challenging flying missions. The hazards that made their missions exciting and memorable came more from the flying environment than they did from enemy guns, and mastering challenges earned a crew respect of their peers. During routine missions, the internal satisfaction of topping flying challenges seemed to overshadow a sense of duty to the airlift mission. With the high daily sorties rates flown by airlift crews, there was no strong sense of obligation because the mission became so routine. Exceptional missions in support of desperate men or personal connections to others spurred and motivated these flyers to action. Missions into dire battles like Khe Sanh, A Shau, and Kham Duc energized a sense of obligation

---

[205] True to Delmore's expectation, a subsequent airlifter pulled them out. McCall interview.

to countless unknown fellow combatants, adding intermittently to the crews' sense of purpose. Tactical airlift crews enjoyed an unusual degree of autonomy in comparison to many other American aviators. Crews were issued a mission, and they appreciated the opportunity to find ways to best accomplish that mission with minimal oversight. Capt Robert Kellock flew in Southeast Asia as a C-130 pilot between 1964 and 1967, and then returned to South Vietnam as a FAC in 1968. He penned a brief paper of observations at the completion of his second combat tour, and argued "local control of men and resources is absolutely necessary in combat," and "centralized guidance must be very carefully given to avoid harming the local operation"[206] The local control and autonomy FACs experienced provided a strong motivator and is a central theme in the next chapter on the men who flew the light spotter planes over Southeast Asia in 1968.

[206] Capt Robert E. Kellock, "Observations on the Conduct of the War," July 28, 1969, 2, Historical Research Agency, Maxwell AFB, AL.

Chapter 7: The Forward Air Controllers

As the evacuation of Kham Duc reached its crescendo on May 12, 1968 relays of three Air Force forward air controllers (FACs) in light aircraft organized the air battle over the besieged outpost. When Capt Herbert Spier arrived in his O-2 Skymaster over Kham Duc in the early morning hours, he found an AC-47 gunship struggling to hold off PAVN attackers "on the verge of overrunning the base." Spier began directing a steady stream of fighters against the besiegers as the evacuation began that morning. Spier's squadron-mates joined him over Kham Duc and set up a three-aircraft "traffic cop" system where two low FACs took opposite sides of the runway to direct fighter strikes, while the third FAC flew above the two, directing arriving fighters to holding patterns and then handing them off to the low FACs when needed. Seventh Air Force's airborne command and control aircraft, a C-130 with the call sign Hillsboro, orbited over the high FAC and its controllers pushed fighters into the battle as fast as the bases in the theater could launch them. Capt Philip Smotherman arrived over the scene at midday, and took over the high FAC station, but his O-2 Skymaster was hit by antiaircraft fire. "I felt a thump...I then looked at my right wing and saw a large portion of the right wing tip missing. The aircraft started to shudder. I made a radio call that the aircraft was out of control and I would be going down near Kham Duc." Smotherman fought the controls to a successful crash landing on the runway at Kham Duc. Undaunted, he found himself as the only Air Force officer on the ground at the outpost, so he located some working radios, and began coordinating strikes and airlift sorties from the ground. By the afternoon, PAVN infantry was so close to the airstrip that the FACs had to turn away fighters with heavy "iron bombs" (mostly 750 pound bombs) to be able to bring napalm, cluster bombs and cannon fire only yards from friendly positions in what Smotherman

described as "an awesome display of firepower."[207] Smotherman's squadron-mates orbited in their small, underpowered propeller-driven aircraft over the battlefield all day, demonstrating determination and courage to safeguard the Americans and Vietnamese on the ground at Kham Duc. They played a pivotal role controlling all the airstrikes into the area around Kham Duc with the exception of B-52 strikes, which Saigon controlled directly.

Air Force forward air controllers flew the least powerful and lowest performance aircraft of the war, but recalled their combat tours in more positive terms than any other group of flyers, because they enjoyed the greatest degree of local control and freedom in carrying out a mission they saw as vitally important. This chapter opens with a description of how pilots experienced flying low and slow in low-tech aircraft. Although FACs did not fly powerful aircraft, with their radios, marking rockets, and skillful flying, they controlled the power of scores of more capable aircraft to protect friendly forces and to destroy the enemy. In 1970, Col John Stoner, a twenty-six year veteran and former World War II B-26 pilot, recalled negative initial reactions towards forward air control assignments that were swiftly overturned by the experience. "When you said 'forward air controller' to [pilots selected for FAC duty] they thought 'Gee, this is the end of the line.'" But the experience was so uplifting that, "it didn't take over a couple or three weeks over there in combat before they were the proudest men I think in South Vietnam."[208] This chapter then describes the FAC mission, which forward air controllers saw as a highly relevant one

---

[207] Kenneth Sams and Maj A.W. Thompson, *Kham Duc*, CHECO Contemporary Historical Evaluation of Combat Operations, July 8, 1968, 15, 23, Air Force Historical Research Agency, Maxwell AFB, AL.

[208] Stoner was on the ground at the US Army's inaugural battle at Landing Zone X-Ray in the Ia Drang in 1965, and saw up close the effects of air support controlled by Air Force FACs. When the commanding general chided Stoner for closer air support, a bomb landed so close that Stoner reportedly picked up a shard of smoking shrapnel and asked "General, is this close enough?" Col John R. Stoner, "The Closer the Better," *Air University Review* (October 1967); Col John R. Stoner, interview by Maj Ralph A. Rowley, May 18, 1970, 16, Air Force Historical Research Agency, Maxwell AFB, AL; Harold G. Moore and Joseph L. Galloway, *We were Soldiers Once...And Young: Ia Drang--The Battle That Changed The War In Vietnam* (Random House, 1992), 194.

because they could see how their skills as aviators led to friendly lives saved and enemy forces and material destroyed. FACs also saw the effects of their actions on the Vietnamese people and countryside, and had to find ways to decide how and when to lead strikes on populated areas and how to reconcile their actions with their personal doubts and the ambiguities of a war waged among a people. Although the dangers over South Vietnam were far lower than Laos and North Vietnam, the low, slow, unarmored FAC aircraft placed pilots at considerable risk when they flew at low altitude. Pilots were generally willing to operate down low because they believed in their mission, and assessed that they could only be effective when they could clearly see friends or foes on the ground. Their willingness to accept risk, however, conflicted with their squadron and group commander's interest in limiting losses. Commanders established a minimum height that they used to protect their pilots from ground fire, but the FACs often violated these directives to get the job done. This routine disregard created tension between desk-bound leaders at squadron and wing headquarters and their charges dispersed over scores of small airfields throughout South Vietnam. Despite their disputes with headquarters, the FACs remained devoted to their mission, and the sources of their motivation conclude this chapter.

With the rapid American build up from early 1965, the Air Force sensed an immediate need to develop forward air control capability to regulate violence and coordinate with Army units in a nominally friendly country. Centralized control of air-to-ground operations was impossible given South Vietnam's size and the war's distributed, small scale, and unpredictable battles. In response to the operational need, the Air Force rapidly created and deployed air control capabilities and procedures. In 1965, the Army modified and transferred 106 of their L-19 spotter planes to the Air Force as O-1 Bird Dog forward air control aircraft.[209] The Air Force created five

[209] These aircraft joined the twenty-three Air Force O-1s already in theater since mid-1963. Schlight, *The War in South Vietnam*, 5-6, 24.

squadrons to oversee the forward air controller detachments scattered throughout South Vietnam and Thailand. Four large squadrons, the 19th, 20th, 21st, and 22nd Tactical Air Support Squadrons (TASS) formed in South Vietnam, with one squadron allocated to operate within each of the four corps sectors. The Tactical Air Support Squadrons oversaw numerous small FAC detachments detailed to support U.S. Army units, or assigned to South Vietnamese provinces to support the ARVN. A fifth squadron, the 23rd TASS, formed in Thailand to control the growing aerial activity over the Ho Chi Minh Trail in Laos.[210] Although Tactical Air Command's Air to Ground Operations School (AGOS) preserved a basic knowledge of Army-Air Force cooperation since the Korean War, the Air Force lacked the units, aircraft, and culture designed to perform the forward air control mission, and pilots lacked an imagined community of forward air controllers to join or measure their experiences against. This meant that FACs were free of preconceptions and able to forge their own identity. It also meant that squadron and group commanders were less experienced in forward air control than their charges, because many senior officers (lieutenant colonels and colonels) were unable or unwilling to fly as much as their subordinates due to their administrative responsibilities. The lieutenants, captains, and majors then, became the experts in the new mission because they flew every day, while their commanders were in danger of falling out of touch.

Flying Forward Air Control: "A Front Seat on the War"

[210] The tactical air support squadrons (TASS) in South Vietnam were three times the size of most fighter squadrons. In 1967, each TASS in South Vietnam had an authorized strength of fifty-five aircraft, and the squadron in Thailand had twelve aircraft. Most fighter squadrons at that time had authorized strengths of eighteen aircraft. The TASS squadrons were large to cover their many forward operating locations. Bonetti, *The War in Vietnam, January - June 1967*, Figure 1, 2.

Air Force FACs operated three primary types of aircraft, which represented a step backwards in sophistication and power for the pilots who flew them. Two were militarized light civilian aircraft that had roughly the same performance as the T-41, the aircraft most of the younger Air Force pilots started with in pilot training.[211] The O-1 was a militarized light civilian aircraft modified with extra windows, radios, and under-wing pods to launch four smoke rockets. A simple six-cylinder piston engine powered the O-1 which gave it an anemic rate of climb and cruising speed of only about 90 knots.[212] The Bird Dog's light weight, simplicity, reliability, and tail-wheel configuration allowed it to operate from short, primitive forward airstrips. Because most Air Force pilots learned to fly higher-performance aircraft equipped with tricycle-gear at pilot training, pilots new to the O-1 had to learn how to land the more basic (but tricky) tail wheel.[213] Pilots enjoyed learning new airmanship skills and enjoyed practicing landings in the O-1. Robert Tilton recalled that at first, his "landings were terrible and the instructor just laughed" but he quickly found "short field landings were challenging but fun."[214] The O-1 lacked a gun-sight for the smoke rockets so pilots marked the windscreen with a grease pencil as a crude aiming reference. To fire a rocket, pilots entered a dive directly towards the target and fired the

---

[211] The Air Force introduced the T-41 in 1964. A variety of simple primary trainers preceded the T-41.

[212] Although the technical manual for the Navy/Marine O-1C (Similar to the Air Force's O-1A) claims a 1,300 foot per minute climb rate, Cessna engineers found Air Force pilots experienced only 200-300 foot per minute climb rates in combat due to the weight of the combat loads. This anemic climb rate kept low-flying aircraft within range of weapons on the ground for extended periods. Lt Col Kane recalled the O-1 "maxed out" around ninety knots. NAVAIR, "Standard Aircraft Characteristics Model O-1C"; William Dennison Thompson, *Cessna, Wings for the World II* (Bend, OR: Maverick Publications, 1995); Lt Col Stuart E. Kane and Capt Gary Sheets, interview by Maj Ralph Rowley and Ben Goldman, May 17, 1970, 4, Air Force Historical Research Agency, Maxwell AFB, AL.

[213] Aircraft with tricycle gear are generally easier to perform takeoffs and landings relative to tail wheel-equipped aircraft, but they require smoother runways and taxiways due to the possibility of the propeller striking the ground on a rough surface. The tail wheel-equipped O-1 took off and landed in a nose-high attitude that allowed operations from the most austere strips.

[214] William Tilton, interview by Stephen Maxner, August 24, 2000, 36, The Vietnam Archive, Texas Tech University.

missile from close range. A near miss was normally considered "good enough" because the resultant smoke was used as an aiming reference for fighters to adjust their fire from. Using the smoke as a reference, FACs relayed attack directions over the radio to fighters in direction and distance (for example: "aim 50 meters north of my smoke").

The Air Force developed an O-1 replacement in 1967 by modifying another civilian aircraft, the twin engine Cessna 337 Skymaster. Named the O-2, but called the "Oscar Deuce" or "Oscar Duck" (the rear wheels retracted rearwards into the fuselage like a duck's feet), the O-2 offered slightly better speed, climb rate, and carrying capacity. It had an unconventional tandem engine configuration with piston engines in the front and rear of the aircraft earning another nickname the "suck and blow."[215] The O-2 featured a gun sight mounted on the dashboard to aim smoke rockets, a big step forward from a grease-pencil mark on the windscreen used by Bird Dog pilots. Pilots still considered the O-2 a low performance machine. Col William Anderson considered the O-2 underpowered as a combat aircraft due to the weight of its military modifications. "During the day, you never carried anybody with you, we didn't carry a parachute because you didn't want any extra weight, [because] that whole back of that airplane was full of radio equipment. In fact you are suppose[d] to have two rocket pods on each side and we only carried one on each side because of the weight."[216]

The OV-10 Bronco joined the O-1 and O-2 in theater in 1968. The Bronco was a high-performance aircraft specifically designed for forward air control. The Bronco's pilots appreciated its power and agility compared to its predecessors. Two small turboprop engines

---

[215] Mike Jackson also referred to the O-2 as "the flying speed brake" and his pet name "sky pig," which underscore the airplane's lackluster aerodynamic performance. Mike Jackson, *Naked in Da Nang: A Forward Air Controller in Vietnam* (St. Paul, MN: Zenith Press, 2004), 21.

[216] Some O-2 units added a navigator for night operations over the Ho Chi Minh Trail. The navigator operated a night observation device (NOD) to locate trucks and other activity. Col William Anderson, interview by Stephen Maxner, September 22, 2000, 24, The Vietnam Archive, Texas Tech University.

powered the OV-10, which nearly doubled the O-1's top speed. This robust military aircraft was attractive to many of its pilots who appreciated its maneuverability. Marshall Harrison liked the Bronco's agility: "what a marvelously responsive thing it was, like having a well-trained horse beneath you, responding to your slightest pressure."[217] The Bronco was equipped with M-60 machine guns and could carry more rockets than the lighter FAC aircraft. Pilots were proud to associate themselves with the aircraft. Thomas Sadler, an O-1 FAC, flew the Bronco in the United States and viewed it as "a hell of a good airplane," favorably comparing it to a variant of a legendary World War II fighter, the "twin-engine Mustang."[218] Tom Yarborough thought the Bronco looked similar to the iconic P-38 Lightning, conjuring up childhood visions of his World War II flying heroes.[219] Considering the images and attractions many Vietnam aviators held towards World War II flyers, Sadler's and Yarborough's characterizations paint the OV-10 in favorable terms. OV-10 pilot Lt Col Stuart Kane evaluated the Bronco in theater between May and November 1968 and assessed it as the "finest forward aircraft in the world."[220]

FACs flew their aircraft low and slow, making for a hot, loud, and bumpy environment. Missions lasted three to four hours, and two or more flights per day were not uncommon. FAC pilots flew with minimal equipment, often little more than a flight suit, a life support vest containing a radio and basic survival gear, charts, and one or more personal weapons. Pilots carried personal weapons for self-defense in case they crash-landed or had to land at a primitive

---

[217] Marshall Harrison, *A Lonely Kind of War: Forward Air Controller, Vietnam* (Novato, CA: Presidio Press, 1989), 120.

[218] Maj Gen Thomas M. Sadler, interview by Lt Col Richard C. McCoy, December 3, 1987, 118, Air Force Historical Research Agency, Maxwell AFB, AL.

[219] Tom Yarborough, *Da Nang Diary: A Forward Air Controller's Year of Combat Over Vietnam* (New York: St. Martin's Press, 1990), 19.

[220] Kane and Sheets, interview, 2-4.

forward airstrip without a local garrison. Keeping a sharp visual lookout was essential for a successful FAC, and grease pencils became a key piece of gear to help keep one's eyes out of the cockpit. FACs wrote grease pencil notes on their Plexiglas windows to record times, call signs, radio frequencies, and bomb damage assessments so that they did not have to look inside their cockpits to retrieve or record information. Pilots flew the O-1 and O-2 with the windows open, which immersed the FAC into the sights and sounds of the surrounding air and ground battle.[221] Most FACs disregarded higher headquarters direction to fly with heavy ballistic (bulletproof) flying helmets due to the visual and aural limitations because there was much to learn from the sounds of the aircraft, wind, and gunfire. Pilots could tell the speed of their aircraft from the sound of the engine and wind, and could hear explosions and small arms fire—so many elected to fly with lightweight headsets. Michael Morea thought the O-1 "was such an open airplane that [it] really made you one with the whole battle environment." At low altitude, FACs could hear rounds pass near their aircraft and clearly see the gunners. An undated summary of tactics and techniques titled *Forward Air Control Procedures*, described the sounds of antiaircraft fire. "Ground fire is usually heard rather than seen….small arms [sound like] click; snap; pop; muffled, dry stick snapping; cigarette lighter snapping shut; a whip cracking; popcorn popping," while fifty caliber fire makes "a heavier, louder woof, [and a] more decisive crack."[222]

Lacking a standing FAC force, the Air Force pulled from all Air Force pilot communities to fill FAC cockpits. The U.S. Army preferred fighter pilots in FAC cockpits because they were

---

[221] The OV-10 had a more enclosed cockpit than the O-1 or O-2. The pilot and passenger were surrounded by a glass greenhouse that suffered from poor air circulation, distancing the OV-10 pilot from the sounds of battle experienced by O-1 and O-2 pilots. The OV-10's initial combat evaluation team noted "the largest disadvantage that they encountered…was aircrew discomfort, due to inadequate cockpit ventilation and the aircraft's greenhouse-like canopy." Joseph V. Potter, *OV-10 Operations in SEAsia*, CHECO Contemporary Historical Evaluation of Combat Operations, September 15, 1969, 4, Defense Technical Information Center.

[222] Jan Churchill, *Hit My Smoke! Forward Air Controllers in Southeast Asia* (Manhattan, KS: Sunflower University Press, 1997), 186.

most familiar with the planes and the weapons they would be directing near Army positions. The demand for pilots to fill fighter cockpits created by the one tour policy and 100-mission tour lengths meant that the Air Force had to pull many FACs from bomber and transport communities as well. The Air Force devised a variety of solutions to satisfy the Army. Fighter pilots were designated Category A FACs and assigned to support U.S. Army units. Non-fighter pilots were designated Category B or C FACs and assigned to regions in South Vietnam in support of ARVN units. In addition to finding suitable roles for non-fighter FACs, the Air Force also found a way to make more fighter pilots quickly. In 1969, Tactical Air Command began conducting short (four month) fighter courses in armed trainers, the AT-33, to nominally qualify pilots as fighter pilots at Cannon AFB, NM. The basic fighter formation and dive-bomb training allowed aviators inexperienced in fighters to see and understand tactics from a fighter-pilot's perspective.[223] After four months of flying AT-33s, the Air Force could label a man a "fighter pilot" even though they had never actually flown a front-line Air Force fighter.

Compared to a jet assignment, many fighter pilots were initially displeased with FAC assignments because they were taking several steps back from flying the best and most powerful planes. Some went to FAC assignments reluctantly, while others went as an alternative to other unappealing options like staff jobs or the back seat of an F-4. Fighter pilot Richard Griffin "was terribly disappointed" when he got a FAC assignment. "I thought, God, that's really going to be a bunch of crap to have to put up with."[224] Some fighter pilots' concerns were due to the low speed, low performance and vulnerability of the FAC aircraft, especially considering that their

---

[223] Jackson, *Naked in Da Nang*, 101; Dan Flak, "Flak's Fighter Fling," accessed September 26, 2009, http://www.danflak.com/military/war_story/warst12.html; Harrison, *A Lonely Kind of War*, 39-50.

[224] Maj Richard L. Griffin, interview by Lt Col V. H. Gallacher and Hugh N. Ahmann, March 24, 1972, 125, Air Force Historical Research Agency, Maxwell AFB, AL.

alternative might have to go to war in a maneuverable machine able to fly fast, high and equipped with defensive systems and an ejection seat.[225] Other pilots anticipated the hardships of living in the field with the Army compared to a relatively comfortable existence at a large U.S. air base.[226] Another aspect was image-related, likely due to the lower status and prestige involved with flying a low-performing unattractive aircraft, especially among fighter pilots whose competitive make-up was often tied up in partisanship for a specific aircraft type.[227] Despite the negative first impressions, John Stoner thought the FAC program was "very underrated" by airmen who hadn't been part of it.[228] F-100 pilot Kenneth Johnson took a FAC assignment as an alternative to switching to the two-seat F-4 Phantom. "I was not going to fly any two-seat, two-engine airplane. If I was going to go to combat, I was going to fly a one-seat, single-engine airplane. I was still a dyed-in-the-wool single-seat, single-engine fighter pilot."[229]

Aggressive tanker and transport pilots sought out FAC assignments to get into the war. Many missed an opportunity to fly fighters due to their standing in pilot training, and saw the type of flying available to FACs as a second chance. FAC aircraft provided an optimal venue because the aircraft were similar to those flown in pilot training and easy to master in a few weeks. This

---

[225] Kane and Sheets, interview, 3-4.

[226] Marshall Harrison wrote in his memoir that having to live with the Army was one of three crosses he had to bear as a FAC: "most of us had joined the Air Force to avoid being drafted into the Army." The other crosses were the certainty of a Vietnam assignment and unattractive aircraft choices compared to a fighter jet. Harrison, *A Lonely Kind of War*, 39.

[227] F-105 Pilot Ronald Bliss encountered a similar attitude from his UPT instructor regarding their T-37 trainer. Upon arrival at a fighter base, Bliss' instructor took the small, unattractive, and unimpressive trainer nearly 100 knots above its maximum allowable airspeed. Buzzing the airfield at 380 knots, his instructor (a former fighter pilot) exclaimed "I have a lot of buddies here at Luke in [F]-100s and I'm not coming in like a chickenshit tweety-bird [T-37] pilot." Bliss, interview, 23.

[228] Stoner, interview, 16.

[229] Brig Gen Kenneth R. Johnson, interview by Hugh N. Ahmann, September 18, 1988, 37-38, Air Force Historical Research Agency, Maxwell AFB, AL.

opportunity was unlike the alternative of transitioning to fighters from heavy aircraft, because proficiency in fighter aircraft often took years to achieve and those who transitioned could not quickly earn respect as a skilled aviator in a fighter unit as they might in a FAC unit. Others viewed a combat tour as a career-enhancing opportunity. Combat as a FAC would look good on a pilot's resume if they returned to their tanker or transport community after the FAC tour. Still others saw a FAC assignment as an opportunity to experience some more exciting flying. Tanker co-pilot William Tilton believed flying as a FAC would be "pretty exciting," so he had to hide his enthusiasm for a combat assignment from his wife who might not understand why he was willing to leave a safe job flying tankers and serve as a FAC. "Having come out of tankers and flying transports at Dobbins, I thought that was pretty good; I was going to get into the combat part of it even without being a fighter or a bomber pilot which is exactly what happened; I got a front seat on the war."[230] Transport pilot Mike Morea volunteered for C-123s in Vietnam, and was happy to be diverted to the O-1. "I wanted to go, and I think the fact that I was going into an airplane other than a transport probably was exciting to me, because I knew that the transport job, relatively, was going to be benign." The FAC mission "sounded very interesting, I was getting out of airlift into tactical operations and both from a purely interest point of view and from a career point of view where diversity has always been considered positive, it looked like a good idea to me so I was quite pleased."[231]

FAC assignments put pilots from all Air Force communities on an even footing. Because the aircraft were easy to fly, all pilots were able to become proficient relatively quickly. Their skill and success as FACs then hinged on individual ability to develop situational awareness of

---

[230] Tilton, interview, 30.

[231] Michael Morea, interview by Stephen Maxner, January 25, 2001, 26-27, The Vietnam Archive, Texas Tech University.

where the friendly and enemy forces were, and their personal aggressiveness in pursuing those enemies. Competitiveness, a winning spirit, and aggression found outlets in the autonomous environment FACs encountered over Southeast Asia. FACs flew three-to-four hour missions alone over their allotted sectors hunting the enemy, and individual will and desire made a decisive difference in their effectiveness. Some flew too high and didn't see much, while a few reportedly avoided the enemy. Most fought hard, exposed themselves to risks, and followed sometimes small and subtle clues to pursue the enemy because they believed in their missions. As an indicator of FAC determination, the Air Force lost more forward air control aircraft in Vietnam than the vaunted, but hard-hit F-105 Thud. The 308 Air Force FAC aircraft that were destroyed during the war included 145 O-1 Bird Dogs, 101 O-2 Skymasters, and 62 OV-10 Broncos. The 20th Tactical Air Support Squadron at Danang Air Base suffered the highest losses of any Air Force squadron in Southeast Asia. It lost 108 aircraft over South Vietnam's heated northern provinces, the DMZ, North Vietnam, and over the Ho Chi Minh Trail in Laos. The 20th TASS and the 19th TASS (which sustained 81 losses) based at Bien Hoa, both suffered more losses than Takhli's hardest-bitten 354th Tactical Fighter Squadron which lost 62 F-105s and F-4s.[232]

The FAC Mission: "Put Your Ordnance on my Target"

Forward air controllers were powerfully attracted to a mission that afforded them the opportunity to fully exploit the freedom of flight and skillfully control tremendous aerial firepower in support of goals they saw as meaningful and relevant. Because FACs flew lower and slower than other Air Force pilots, they saw the effects of their actions in enemy forces destroyed and friendly forces saved more clearly than any other USAF aviators. FACs also had far greater autonomy in deciding what was bombed and what was not, and they clearly observed the results

---

[232] Hobson, *Vietnam Air Losses*, 250-258.

of their decisions. This meant that unlike other groups of Air Force aviators, FACs closely directed and observed killing from the air, which led to the adaptation of several strategies to reconcile personal doubt and accept and justify their actions.

FACs flew three general types of missions: they controlled attacks on targets picked in advance by the Army; they conducted visual reconnaissance of assigned sectors and picked their own targets; and third, they worked with nearby ground units and directed close air support in support of those units. The pilots serving as FACs drew little satisfaction striking at targets picked by distant headquarters, but saw the other two missions (visual reconnaissance and ground support) as important and relevant to the war, which motivated them to perform to the utmost of their ability.

Pilots found controlling strikes against targets picked by headquarters as the least attractive of their three missions because few strikes appeared to hit anything meaningful. Army staffs worked with their Air Force counterparts to identify and prioritize targets for aerial attack, and the Air Force staffs relayed those targets to local forward air controllers in the daily air tasking order. The time required to nominate, pick, and then relay targets between the two services resulted in delays that diminished the utility of many fleeting targets. Once directed to hit a designated target, the assigned FAC attempted to find it and direct fighter airstrikes against it, even though some targets might be days or weeks old. Pilots perceived that many targets were based on poor or outdated intelligence, and they griped that few preplanned strikes achieved results. Harold Freeman found that sketchy intelligence combined with the jungle canopy to make target identification problematic and constituted "the most frustrating part of the entire thing."[233] OV-10 pilot Marshall Harrison found it frustrating and difficult to accurately locate these dubious

---

[233] Capt Harold R. Freeman, interview by Maj Harry Shallcross, October 4, 1967, 13, Air Force Historical Research Agency, Maxwell AFB, AL.

headquarters-assigned targets in featureless tracts of jungle. FACs were challenged by "the Green Square," a name they used to describe the endless square kilometers of solid jungle delineated only by grid lines on their charts. A lack of navigational equipment complicated their task in pinpointing precise locations within one of the "green squares." During Harrison's FAC checkout, an instructor proclaimed "That Green Square is an ass-kicker" because accurate navigation was difficult over many stretches of jungle. "Bout all you can do is put in one bomb," that might uncover something of value "and hope for the best."[234] Glenn Russell recalled one ground commander's attempt to compensate for questionable intelligence and navigation by saturating entire one kilometer grids with firepower. As a FAC, Russell controlled the mission, "so it was kind of fun" and "very interesting to watch," but he believed the effort "didn't work."[235]

Although many strike sorties were inaccurate and wasteful, twenty thousand monthly air Force, Navy, and Marine strike sorties extracted a heavy physical and psychological toll on the PAVN and PLAF insurgents (and considerable numbers of South Vietnamese civilians, which will be discussed later in this section). The war diary of Dang Thuy Tram, a PAVN doctor in Quang Ngai Province between 1968 and 1970 recounts a constant sense of tension under the threat of U.S. aircraft. FACs directed numerous airstrikes into the near proximity of Dang's semi-underground jungle clinic, where she treated soldiers wounded and burned by the airstrikes. "An OV-10 plane circles above, shining light and firing streams of bullets down onto the battlefield. In the middle of the night, red bullets, like fire pour down onto the battlefield and into my heart. Who will those bullets hit?...I do not sleep the entire night. Worries, anger, and hatred press

---

[234] Harrison, *A Lonely Kind of War*, 77.

[235] Glenn Russell, interview by Joyce Garner, May 27, 2005, Veterans History Project. Library of Congress.

heavily on my heart."[236] Although preplanned strikes may have wreaked considerable destruction upon hidden insurgent bases like Dang's, Russell and his peers preferred instead to find targets that they could identify, on their own, during frequent visual reconnaissance missions.

Visual reconnaissance appealed to many pilots due to the flexibility and freedom it afforded them to hunt the enemy in a highly individualistic manner. FACs became intimately familiar with a sector, detected changes and directed air strikes against suspected enemy forces and facilities. Pilots grew to understand local patterns of behavior, learned the terrain, and then applied that knowledge towards finding an elusive enemy. John Stoner remembered how his own growing experience led to greater effectiveness. "I can remember flying along" flying visual reconnaissance, "trying to find something and seeing very little and then [you] wake up one morning and go out there and actually see roads that were under those trees I'd been flying through. You learn to see through that stuff sooner or later. It just takes experience within the terrain that you work."[237] Richard Griffith believed that "there's nothing you can swap for that kind of [local] knowledge."[238]

Visual reconnaissance was a valued mission to many FACs because it lent opportunity to exercise imagination and individual agency in ferreting out the enemy. O-2 FAC Tom Pilsch recalled an incident where one of his fellow FACs spotted a tiny glimpse of a sampan during the day and plotted to destroy it and a cache of military supplies through a night time radar-directed airstrike when the site would be in use. Pilsch assessed that "because of his sharp eye and

---

[236] Dang was killed by an unspecified American or ARVN action in 1970. Dang Thuy Tra□m, *Last Night I Dreamed of Peace: The Diary of Dang Thuy Tram* (New York: Harmony Books, 2007), 122.

[237] Stoner, interview, 17.

[238] Griffin, interview, 81.

curiosity, he was able to obtain some spectacular results."[239] Richard Griffin believed his insights into human behavior led to greater effectiveness. He noticed that when he looked behind his aircraft during visual reconnaissance he could spot people who were hiding (and otherwise invisible) because they would look up as he passed by. "It's amazing how many times you'd fly by an area and see nothing, but if you're looking behind you, you'd see one of those little rascals' faces shine up at you. After you've passed, you just can't keep from looking...if you want to see people generally you'd see them behind you."[240] Griffin also tried ruses to draw out his adversaries. In one case, he recounted swapping his grey Air Force O-1 for a green U.S. Army O-1 in order to encourage careless behavior by the insurgents, because Army FACs were not trained to control USAF aircraft.[241] Michael Cavanaugh dreamed up several ruses to fool his enemies into exposing themselves. "I had all kinds of tricks" including fake radio calls, and feigning a crash (complete with smoke from a grenade) to entice insurgents to move towards the anticipated crash site. As he pulled out of his apparent death-dive, he called in airstrikes to "hammer the shit out of them."[242] Griffin and Cavanaugh saw the opportunity to outthink their adversaries in a lethal contest. It appealed to their aviator's drive to use their skills and creativity to win and prove they were the best.

The rules of engagement put considerable power into the FAC's hands. The bitter resentment voiced by Rolling Thunder's fighter crews is largely absent in forward air controller

---

[239] Tom Pilsch and Joe Sadowa, "Visual Reconnaissance: The Sunken Sampan, January 1968, III Corps," *Air Operations: Vietnam*, accessed July 24, 2010, http://www.cc.gatech.edu/fac/Thomas.Pilsch/AirOps/vr-sampan.html.

[240] Griffin, interview, 71.

[241] Ibid., 26.

[242] Col Michael E. Cavanaugh, interview by Hugh N. Ahmann and D. Alexander, June 11, 1986, 86-87, Air Force Historical Research Agency, Maxwell AFB, AL.

accounts of the war. The rules of engagement privileged FACs by barring most air strikes outside their direct control within South Vietnam. The ROE placed significant numbers and types of targets off limits to protect South Vietnamese civilians, troops, and property. FACs had to gain permission for many strikes from the local Vietnamese province chief, normally an ARVN field grade officer, who was supposed to account for friendly troops and civilians and deny an attack request if they might be endangered. But few FAC narratives suggest local approval proved to be much of an obstacle. Large areas designated free strike (or more popularly "free fire") zones were supposedly swept clear of civilians, and strikes there were easily approved. FAC William Dorroh noted that his province chief delegated strike authority to his operations officer who "had carte blanche approval…[and] as long as it was in a free fire [zone], he'd hit it."[243] FACs enjoyed a relatively free hand in putting airstrikes into free fire zones. Michael Morea recalled that his sector featured "a big open swamp free fire zone with a couple of little towns…[and] with some judgment occasionally, anything that moved out there you shot at." Morea explained that "as we understood it, [a free fire zone] meant that basically no one lived there. No one could live there and anything that moved in that area was considered a target, be it man or beast."[244] Free fire zones, however, were porous and contained civilians who either evaded government relocation or infiltrated back into their ancestral lands, mandating a need for strict discrimination of civilian and military targets in a FAC's direction of airstrikes.[245]

---

[243] Maj William E. Dorroh, interview by Lt Col Valentino Castellina, April 10, 1968, 15, Air Force Historical Research Agency, Maxwell AFB, AL.

[244] Morea, interview, 43-44, 53.

[245] A controversial history of an American unit and its alleged atrocities in Quang Ngai province in 1967 describes the prevalence of civilians in free strike zones. Michael Sallah, *Tiger Force: A True Story of Men and War* (New York, NY: Little, Brown, 2006), 29-40.

Many FACs believed they could discern civilians from insurgents, given enough experience. Richard Griffin thought there were "little keys" to tell an enemy combatant, including the presence of weapons, black clothing, or panicked behavior. Subtle indicators may have accurately identified hostile military combatants, but they may be viewed with skepticism. War correspondents, for example, followed an "essential rule" when covering an aerial attack: "stand still and lift your face towards the pilot" so as to not be confused for a felling combatant. This lesson is unlikely to have been lost on PAVN and PLAF fighters and incorporated into their training. Untrained civilians, when frightened by the presence of aircraft may have been more likely to run towards cover. The family of Kim Phuc, well-to-do peasants, panicked and fled from fighting in their village northwest of Saigon and were hit by VNAF Skyraiders in June 1972. The reporters standing calmly at a nearby crossroads captured the event on film, snapping one of the war's iconic photographs of Kim Phuc and her family splashed with napalm, running in terror.[246]

To Griffin and other FACs, the aggregation of multiple small clues and experience mattered most when sorting out friendly forces, civilians, and insurgents. "Number one" though was "that you knew the area well enough to know that there were no friendlies in there, probably."[247] Thomas Sadler keyed on behavior patterns: "You learned to read sudden changes in activities on roads in the villages." A normally busy village, for example, that suddenly went quiet indicated "either the VC or the NVA were in there."[248] If VC were present, there were likely

---

[246] Denise Chong, *The Girl in the Picture: The Story of Kim Phuc, the Photograph, and the Vietnam War* (New York: Viking, 2000), 60-69.

[247] Griffin, interview, 71, 74.

[248] Journalist Richard Schell flew with a detachment of O-1 Bird Dog FACs in 1967 and questioned the pilots on how they could tell friend from foe. He reported responses ranging from proximity to cover, to presence of cooking fires in the morning to how suspected combatants walked. Sadler, interview, 112; Jonathan Schell, *The Real War: The Classic Reporting on the Vietnam War with a New Essay* (New York: Da Capo Press, 2000), 367.

to be civilians still present, since the insurgents drew support (by persuasion, intimidation, or by force if needed) from the local peasants. This placed civilians between a rock and a hard place facing insurgent coercion and allied firepower. Some FACs were sensitive to this issue, and Griffin hedged his "probably" later in his narrative, asserting that if he had any doubts, he would let suspected enemy go. "If there was ever any reservation in my mind that they could be friendlies, I'd let it go.…you're trying to win their hearts and minds … if you let three or four of them go, no big thing. At least, that's the way I looked at it. I think most people did."[249]

Morea's and Griffin's caveats, "occasionally" and "probably" indicate the degree that they operated in an environment without certainty, yet the lethal force they controlled had an absolute character for those under their sights, generating moral dilemmas for the pilots. Despite the rules and approval of local authorities, FACs had to confront personal doubts over the legitimacy and moral validity of their missions.

Doubts were most striking to newcomers, and their greatest doubts arose from strikes in populated areas. Some FACs expressed an initial reluctance to strike villages, but for many the reluctance wore off and gave way to routine strikes. While other FACs recalled exercising considerable restraint. On William Tilton's first mission, his instructor took him close to the Cambodian border west of Saigon and picked out a compound as an introductory target. Tilton recalled his inexperience, but also his moral reservations: "I can't tell you why that was a good target. I'm not even sure that I felt comfortable about it at the time except that this was a free strike zone and anything in there was to be struck with the concurrence of the VNAF." Despite his concern, Tilton saw other Americans willing to bomb the structures, establishing a norm for combat: "the F-100s, they had no problem….and did a very precise drop." Tilton, however, still voiced doubts, recalling "I don't remember ever seeing anything on the ground that looked like a

[249] Griffin, interview, 74.

target during that checkout flight."[250] Although he was concerned over the propriety of his target, Tilton deferred to the authority of his instructor, congruence with the rules governing free fire zones, and the diffusion of responsibility between himself and the F-100s. He took consolation from the good effort (the "precise drop") and that the F-100 pilots had no objections to the FAC's directions. The cooperative efforts of the F-100s and the FACs may have served to create mutually reinforcing legitimization of behavior that the newcomer, Tilton, found questionable. Tilton saw the F-100s attack without hesitation, and the F-100s deferred to the FAC, who directed the attack.

Initial reservations slowly subsided with acclimatization to, and acceptance of, the prevalent norms, growing hostility through exposure to the war, and desensitization to the killing. For some, initial reluctance faded as exposure to the war deepened. Kenneth Johnson explained his initial reluctance to inexperience with a hostile people and the nature of war, but became acclimatized to the use of violence in the vicinity of civilians. "You change your mind in a hurry. You find out that enemy is enemy, no matter what the gender is. I was a little squeamish over that initially when I went over there and worried about the civilian population." He leveraged the hostile acts of some and applied them to the wider population which gave him the ability to live with civilian casualties: "when you draw fire from a civilian population area and you see soldiers that are blown up from 'friendly' areas, you begin to change your feeling." Johnson also attributed the need to strike near civilians as inherent to the nature of war itself: "war is hell and you roll up your sleeves and have at it."[251]

---

[250] Tilton, interview, 47-48.

[251] Johnson related further: "I know where a lot of the brigades went into villages and where they had instances like I was telling you about, hand grenades pitched at them and old ladies shooting at them with AK-47s." Johnson, interview, 70.

Other pilots recalled exercising constraint near towns. Kenneth Johnson recalled that "We had friendly areas down there that we couldn't bomb" and that even if he "took fire from a friendly village, we couldn't bomb back." He noted, however that if fired upon from an unfriendly area, he would be able to gain clearance from local Vietnamese authorities. [252] Although the U.S. needed South Vietnamese approval for many targets, John Stoner believed that Americans showed greater restraint towards villages than the Vietnamese officials did. In meetings with the Vietnamese II Corps commander, Stoner recalled a village described as "all VC," and that there were no operational restrictions. "We didn't buy that. We wouldn't go firing; in my time we never fired a village. We never would have hit them arbitrarily with air 'till the Army got in there and determined what we had to do. So I think the Americans put constraints on that were more restrictive than those given to us by the ARVN."[253] Mike Morea recounted "we bombed villages all the time," but "we made a considerable effort to determine that they were empty and what we, at least the intent was, is we were destroying infrastructure." Morea voiced skepticism like Stoner's towards Vietnamese direction of American bombing. "There was always a nagging suspicion I would say, in the back of our minds, when we got a target from the Vietnamese particularly, about whether this was really military or was it political." In some instances Morea questioned the propriety of Vietnamese-directed strikes, and on one occasion, he interrupted a VNAF strike against a village that lacked indicators it was hostile. "I just didn't feel right, I just basically dove down to the village and flew up and down the village at very low

[252] Ibid., 69.

[253] Stoner, interview, 11.

altitude, kind of figure eights so that basically they couldn't drop any more bombs," after which the Vietnamese A-1 Skyraiders flew away.[254]

Mike Cavanaugh flew in support of the ARVN, and he developed a close working relationship with the local Vietnamese commanders that overrode his suspicions. This close relationship enabled Cavanaugh to gain quick approval for visual reconnaissance targets, but may have obligated him to support strikes on questionable targets. Cavanaugh was suspicious over a request by the local commander to bomb a village close to Bien Hoa, and challenged the request. A pair of VNAF A-1 Skyraiders refused to strike the town under his direction, adding further suspicion regarding the validity of the target, but Cavanaugh concluded "I've got to trust my province chief" and brought in two American F-100s who were willing to carry out the attack. "I don't know whether it was a political problem or what, but the province chief was elated. He gave me another Cross of Gallantry."[255]

Forward air controllers experienced the killing in war from a closer and more personal perspective than any Air Force aviators. This stemmed from the flying with the windows open, at low speeds and low altitudes, which led to very personal involvement. Unlike Rolling Thunder's pilots who only had brief glimpses of a target, FACs could loiter over their targets for hours, planning a strike, controlling it, and then assessing its results. Observation often included direct sighting of enemy combatants and civilians on the ground, unlike Rolling Thunder's objectified "targets." Proximity to the enemy allowed direct observation of the combatants, increasing the emotional content of battle. Mike Jackson, an OV-10 FAC found it "almost a relief" when he did not see any evidence of enemy dead after controlling his first air strike, and hoped to sustain what

---

[254] Morea, interview, 74-75.

[255] Cavanaugh, interview, 157.

he called a "honeybee accommodation" with the enemy, where they might each ignore the other. His accommodation was shattered with his first confirmed enemy casualty, but he assuaged any guilt he felt with the necessity to act to save friendly soldiers. Reluctance towards killing was later replaced by a "kill or be killed" paradigm after surviving an enemy rocket attack on the air base in Danang. This acclimatization to violence was complete when Jackson scored an improbable direct hit with a smoke rocket on an enemy soldier firing at him without any moral reservations. He later wrote "the pink smoke was pretty in a macabre kind of way."[256] Tom Yarborough, also an OV-10 FAC, was shaken by his first look at enemy dead; troops he had caught in the open with his OV-10's machine guns, attacking an American position. "I'd fired a lot of rockets and bullets at the bad guys, but this was the first time I'd actually seen dead bodies as a direct consequence of my actions. The sight of those lifeless forms left me with an unsettling panicky feeling. The mood passed after only a few minutes, but the vivid picture of two of the enemy soldiers sprawled on top of each other lasted for days."[257]

Close proximity to the destruction of aerial attack demanded a range of coping strategies. In his seminal *On Killing*, Dave Grossman describes a succession of reactions following an act of killing: the elation of a victory in battle is followed by guilt, rationalization, and then acceptance.[258] For airmen involved in bombing, elation accompanied a successful hit on the intended target, which validated one's aviation skills. FACs experienced exhilaration from guiding an accurate attack and seeing the explosions on target, but they had to find ways to rationalize and accept their actions in the war more than Rolling Thunder's fighter crews due to

---

[256] Author and fighter pilot Samuel Hynes labels such a plain and grotesque description of the dead "battlefield gothic." Samuel Lynn Hynes, *The Soldiers' Tale: Bearing Witness to Modern War* (New York: A. Lane, 1997), 26; Jackson, *Naked in Da Nang*, 134, 143-144, 209-210.

[257] Yarborough, *Da Nang Diary*, 239.

[258] Grossman, *On Killing*, 232.

their proximity to the object of their attacks. Fighter crews flashed overhead and were gone in seconds, while FACs lingered overhead for minutes or hours. As already described in Chapter Three, fighter crews adopted a variety of mental coping methods, but their speed physical distance, and collective squadron-sized raids almost always left room for doubt that they had actually killed anyone (G.I. Basel, for example wondered if the MiG pilot he shot down actually bailed out). But FACs like Tom Yarborough could not escape the reality of their actions and the sight of the dead, killed through their own actions could by "unsettling." For the FACs, rationalization and acceptance were important and took many parallel paths, which most prominently featured emotional distancing through language, group affirmation, dark humor, and deference to authority.

FACs saw the impact of their actions more closely than any group of Air Force pilots and used language to distance themselves from the realities of how they acted. FACs lacked the physical distance enjoyed by other crews conferred by speed, high altitude, or radar scopes. The need for distance seemed most acute in strikes on villages. Bird Dog FAC Harold Freeman recalled hitting mostly "VC huts, encampments and training areas" during one operation.[259] His use of the label "VC" legitimized and rationalized questionable targets in official reporting, but could also legitimize airstrikes to oneself. Journalist Jonathan Schell flew with Bird Dog pilots in 1967 and observed routine and widespread strikes against villages, which pilots reported as "enemy structures." Observing an air strike on a village and a pair of large churches from the rear seat of an O-1, Schell queried his pilot about their post-strike report. "I asked him whether he considered the houses and the churches military structures. 'Oh that's just what we call them,' he

[259] Freeman, interview, 6, 12.

replied."[260] J.C. Pettijohn and W.L. Stringer recounted directing air strikes against fifteen to twenty villages partially obscured by trees along likely infiltration routes from Cambodia. Because jungle partially obscured the villages, the pilots labeled them "camouflaged villages," and following their destruction, transitioning to radar-directed bombing to hit more dispersed settlements after destroying the main villages.[261] The use of the military term "camouflage," suggests the villages were military targets, while the dispersal of the remaining structures suggested military dispersal, utilizing language to mask any of their own reservations and justify the validity of attacks on many apparently civilian targets. Richard Griffin, while serving on the ground with an ARVN unit, controlled an airstrike against structures spotted a mile away. Although he doubted the utility of striking the "hooches," the application of an airstrike on hooches had become so routine that he hoped the air strike might provide some training value to the ARVN unit, demonstrating "what you can do with air and maybe that was worth something in itself."[262]

Schell was one of the few civilians to fly combat missions with the Air Force over Southeast Asia, and sensed conflicts of conscience below the surface among the FACs he flew with over Quang Ngai Province. His narrative describes FAC pilots finding emotional release through songs, joking, robust group laughter, and group reaffirmation of attacks Schell believed were morally dubious. The pilot who had acceded to a ground commander's request to destroy the two churches (one displaying a white flag), recounted his actions after the mission to other pilots: "'We bombed two churches!' and gave a laugh that seemed to register his own surprise

---

[260] Schell, *The Real War*, 322.

[261] Maj J. C. Pettijohn, Col W. L. Stringer, and Col Colvini, interview by Col Archie S. Mayes, January 1966, 2, 19, Air Force Historical Research Agency, Maxwell AFB, AL.

[262] Griffin, interview, 121.

and wonderment at the act." The pilot was perhaps incredulous over the action, but he may have also been seeking affirmation or rejection of his actions by his peers. A squadron-mate affirmed his actions "yeah I saw the white flag when I was out today…we'll have to get that white flag. It's a matter of *principle*." That night, laughter accompanied over the top songs and comments, which enabled the pilots to endorse the acceptability of their actions as a group. Schell heard the pilots sing a version of "Strafe the Town," a song featuring dark humor to lighten an apparently troubling subject in a public and group setting.

> *Strafe the town and kill the people*
> *Drop napalm in the square*
> *Get out early every Sunday*
> *And catch them at their morning prayers*
>
> *Throw candy to the ARVN*
> *Gather them all around*
> *Take your twenty mike-mike*
> *And mow the bastards down*[263]

Although FACs exercised considerable autonomy in choosing targets and they sought that control, they were willing and able to transfer responsibility for morally questionable strikes. Cavanaugh framed the strike as a matter of trust in the province chief, with whom he had a close relationship. Others transferred responsibility to the target approval process to prevent strikes on friendly or civilian targets. Richard Griffin recalled that "you sort of count on the system keeping you from bombing the wrong target." He overly-optimistically believed the rules of engagement applied to FACs who "couldn't shoot at anything but approved targets," and that the approval process, which included several American radio operators, a U.S. Army advisor, and a

---

[263] "Strafe the Town" has persisted in fighter squadron songbooks for decades since Vietnam. Years after his time in Vietnam, Schell recalled, "I sensed a deep uneasiness and regret among the pilots. They sometimes sang rather brutal ditties that seemed to me like confessions in a way." Christian G. Appy, *Patriots: The Vietnam War Remembered from All Sides* (Penguin, 2004), 202-208; Schell, *The Real War*, 319-326.

Vietnamese district chief, who "may even get on the phone and call a sub-district" would be able to verify valid targets despite the limited Vietnamese communications infrastructure.[264]

American FACs showed the least restraint and most willingness to call in immense firepower when American ground forces were at risk. The churches that Jonathan Schell saw destroyed were bombed at the direction of the local U.S. Army ground commander. The Tet Offensive's city fighting placed restraint towards civilians and the need to support troops on the ground in opposition, and airmen sided with American troops. The Air Force's contemporary history observed that during Tet, the allies reluctantly reverted to the U.S. Army's preferred countryside tactics in the cities: "fix the enemy, pull back, bring in air" in order "to reduce allied troop casualties."[265] Although USAF pilots assigned as air liaison officers to Army units were concerned about putting strikes into populated areas, they ultimately demonstrated loyalty to U.S. ground commanders and transferred trust and agency to the leader on the ground. Thomas Garvin, the 25th Division air liaison officer supported the firepower-intensive battle to retake Ben Tre. He reported that "on my first strike that I put in close to Saigon I had a bad feeling because the VC had moved into…a nice little town, a pretty place, very picturesque." Garvin was clearly troubled by the apparent necessities of the battle, but quelled his misgivings, and did not examine deeply the potential for civilian presence in the town due to the urgent requests of the American ground commander. "It was a little difficult to start putting in that kind of ordnance because I realized that before the day was out we were going to make a lot of people homeless. I had to assume that there weren't any friendlies down there or innocent civilians." The wording of his post-combat report on the battle suggests a gradual self-justification process that he used to convince himself

---

[264] Griffin, interview, 72-74.

[265] Thompson and Thorndale, *Air Response to the TET Offensive*, 26.

of the mission's propriety: "I believe there weren't [civilians present]; I'm quite sure there weren't because the civilians assured us that all had been evacuated. However the VC were in there in great numbers."[266] FAC James Gibson, assigned to support the same division, directed heavy air strikes into Ben Tre, and suggested the following four justifications for the strikes in his after action report: the enemy was responsible, he had no choice, the strikes saved American lives, and he deferred to (ground) authority. "The way we selected these targets was determined by the VC. They chose the battleground and we really had no choice….There were American soldiers laying dead on the road and there were going to be a lot more if we didn't put ordnance into the town. The choice for putting ordnance into the town—as for putting all ordnance in—was the Brigade commander's and I think he made a wise decision in the situation because without air delivery they would have been pretty well wiped out."[267] The struggle for Ben Tre became an icon of the entire war when a flustered Army Major tried to explain the battle with the assertion "it became necessary to destroy the town to save it."[268] Saving friendly lives introduced a sense of moral clarity and helped assuage doubts when FACs received praise from ground units they helped save, even when the situation mandated bombing a village.

Controlling strikes in the close proximity of friendly ground forces constituted the most challenging, but rewarding FAC mission. Close air support (CAS) provided fire support to troops in contact with the enemy, and forward air controllers communicated with ground units below and fighters overhead to kill the enemy and save friendly lives. The mission was immensely challenging because pilots had to identify friendly and enemy positions, clearly identify those

---

[266] Ibid., 26-27.

[267] Ibid., 40.

[268] "Major Describes Move," *New York Times*, February 8, 1968, 14.

positions to bomb-carrying fighters, mark the target with smoke rockets, smoke grenades, or flares, and then direct the fighters on each pass. FAC training emphasized the need to scrutinize and anticipate the results of every bomb run to ensure its accuracy, and if in doubt, to direct the pilot to abort the pass.[269] This required outstanding three-dimensional situational awareness. Pilots had to continuously keep track of the situation on the ground and in the air, which often involved several flights holding over the target at once. As an additional challenge, the FAC monitored two to three radios, and had to position his aircraft in the right place to watch every bomb run, but far enough away to avoid midair collisions with the fighters as their pilots focused on making an accurate bomb run. Frequent periods of poor visibility and low ceilings could compress many aircraft into a small area, increasing the danger of midair collisions and substantially complicating the FAC's responsibilities.

The mission was most intense due to the proximity of friendly troops to the bombing, especially when insurgents got very close to friendly positions. The consequences of inexact situational awareness or of inaccurate bombing were matters of life and death. If the close air support got too close to friendly positions, fellow American or ARVN soldiers could be (and were) hit by friendly bombs, called "short rounds."[270] Conversely, if the air support was too distant, it lacked effectiveness and enemy combatants could close with the friendly troops. Desperate ground situations routinely required FACs to direct strikes well inside minimum mandated safe distances. O-1 FAC Joe Madden recalled that the rules of engagement mandated that cluster bombs could be dropped no closer than 1,500 meters from friendly positions, but

---

[269] Harrison, *A Lonely Kind of War*, 86.

[270] Anderson, interview, 17-18.

"Christ, I was using that on the perimeter [of friendly positions]."[271] Tom Yarborough recalled his initial reluctance to drop inside one hundred meters from friendly troops but then steeled himself to drop within twenty meters after an encircled Green Beret team, whose radioman pleaded "Son, forget your goddamn rule book and get on with it. I'd rather take my chances with you killing me than let the VC get us." This human connection convinced Yarborough to try. "A man that eloquent had to be saved."[272]

FACs had to make gripping risk determinations on how close to friendly positions that they allowed fighters to bomb. Fighters normally carried mixed weapons loads, most typically hard bombs (500 or 750 pound "iron bombs") which had relatively large lethal blast radii, napalm which burned a narrow football-field length swath, and twenty millimeter cannon fire which had a small localized destructive effect. Regulations prescribed the minimum distances these weapons could be dropped safely from friendly troops, which varied from over 700 meters for 500 pound hard bombs, to 115 meters for napalm and 45 meters for cannon fire.[273] In practice, however these distances were more often breached than they were observed due to the urgency of the ground situation. The FAC might call for close in weapons like napalm and cannon fire initially to drive the enemy away from friendly positions, followed by hard bombs more distant from friendly positions. FACs also had to account for the typical accuracy from pilot and plane. All agreed that the slow-moving A-1 Skyraider pilots dropped most accurately due to their slow speed and veteran pilots (especially VNAF pilots who flew A-1s for their entire careers). Although individual preferences varied, many FACs preferred to work with the small but accurate

---

[271] Madden, interview, 21.

[272] Yarborough, *Da Nang Diary*, 133.

[273] United States Air Force Division Air Liaison Office, 4th Infantry Division, *Vietnam Lessons Learned No. 77: Fire Support Coordination in the Republic of Vietnam Appendix 2: General Air Munitions Data*, June 1, 1969.

A-37 and F-5 jets if A-1s were unavailable, followed by the ubiquitous F-100 Super Sabre, but least preferred the fast-flying F-4 Phantom, which many FACs lamented for its inaccuracy. Joe Madden hailed the A-1's superior accuracy, "but day after day the F-100 did the job. The F-4 was notable by the rare times when it did any damn thing worthwhile. I know that's a harsh judgment but I don't know if that judgment should be laid at the feet of the people flying the airplane or at the airplane itself.…I don't know why the F-4 was so gross, but it was."[274] Pilot skill and experience made a difference in accuracy, and experienced FACs tested the abilities of each pilot with an initial drop a conservative distance in the enemy rear to evaluate their performance and adjust where he would be willing to allow each pilot to drop. Mike Cavanaugh judged "how they did on that first go, and then would work them as close as I could without killing somebody."[275] FACs had to strike a delicate balance between the human and technical limitations of accuracy and the destructive potential of air-to-ground weapons with pleas from the ground commanders for air support. FACs accepted risks on the behalf of others, whose lives they held in their hands.

Some airstrikes went bad, killing friendly troops. In 1968, the Air Force reported fifty "short round" incidents where fixed wing aircraft strikes by the Air Force, Navy, Marines and Vietnamese Air Force killed 219 friendly soldiers and civilians. Nearly one half of these casualties occurred in Tet's heavy close-in fighting during the first quarter of the year. Although the reported casualty rate was low considering U.S. and VNAF aviators flew roughly twenty thousand strike sorties per month, FACs and fighters had to be eternally vigilant and precise. During the latter half of 1968 and first half of 1969, pilot errors were the most common cause of

---

[274] Madden, interview, 23-24.

[275] Cavanaugh, interview, 107.

short rounds, followed by unknown friendly troop positions (where the ground commander or the FAC did not know that there were friendly troops nearby). Weapons malfunctions that caused the bomb or missile to miss, ranked third.[276] FACs and fighter crews had to communicate precisely, bomb accurately, and maintain high awareness of the shifting situation on the ground and in the air. No airman wanted the responsibility for killing a friendly troop. Kenneth Johnson directed an airstrike that killed a friendly soldier, but found refuge in the soldier's own actions that placed him at unnecessary risk. "We sure hated that we killed that young soldier. Come to find out, he didn't button down. (They were in Armored Personnel Carriers.) He was up watching and had his head out, standing on top looking." Johnson had based his decisions to bring air strikes in close because he was supporting armored troops. "We had killed that young man from working that strike in closer. He did not follow instructions to button down."[277]

Many FACs established personal ties with ground commanders and units that spurred them to action. Jackson recounted an air strike in the vicinity of "one of my firebases" indicating a personal sense of connection and responsibility for a local Army outpost.[278] Richard Griffin noted that ground units knew each of their FACs by radio call sign and that isolated camp commanders considered some FACs "their FAC" just as pilots thought of different camps as their camp.[279] The emotional ties became so great during close air support to American troops in contact, many FACs elected to use their personal weapons against visible enemy soldiers. William Anderson used rockets, grenades and M-16 fire to delay enemy soldiers chasing a small

---

[276] J. D. Schlatter, *Short Rounds, June 1968 - May 1969*, CHECO Contemporary Historical Evaluation of Combat Operations, August 15, 1969, 1-9, Defense Technical Information Center.

[277] Johnson, interview, 69.

[278] Jackson, *Naked in Da Nang*, 265.

[279] Griffin, interview, 43, 59.

American unit. The Americans were able to slip away due to the FAC's use of his personal weapon: "they got across the river and they met me at the club that night and buying me drinks and they were pretty happy that they got back to their armored personnel carrier."[280] Tom Yarborough flew as part of an Army-Air Force special mission (Operation Prairie Fire) along the Ho Chi Minh Trail, and became uncommonly close to the Green Berets he supported from his OV-10. "The invisible bond between that team on the ground and that pilot with his finger on the trigger is beyond explanation." Yarborough and his fellow Prairie Fire FACs "would break every rule, take any chance to help a reconnaissance team."[281]

Emotions audible over the radio created personal connections that strongly motivated the FACs, who then tried to relay a sense of urgency to spur the supporting fighters. Most fighters lacked radios compatible with the ground troops and the FAC would cajole, motivate and encourage fighters to perform to their utmost in support of the men on the FAC's other radio. Mike Cavanaugh considered troops in contact as "the ultimate in combat, to be able to save guys who are getting beat up" but needed to translate the urgency he perceived through his radios to "a big fighter jock" who saw little of the battle due to speed and height, and (according to Cavanaugh) lived in an air conditioned trailer far from the war. "I would tell them, 'Gentlemen, I would like for you to be excited about this war as I am, because I have some of my people that I live with and eat with that are dying. If I could get you excited about that, I would like for you to put your ordnance on my target, at this time, and quit moseying.'"[282]

---

[280] Anderson, interview, 21.

[281] Yarborough, *Da Nang Diary*, 219.

[282] Cavanaugh, interview, 80.

If fighters were not available, many FACs felt such a sense of obligation, they made foolhardy attacks using their own light weapons. At the height of the November 1967 battles around Dak To, Joe Madden put in over one hundred close air support strikes over a five-day stretch and was deeply committed to protecting the Army brigade he was assigned to support. "I spotted this 12.7 [millimeter] machine gun. He was firing, and there were three guys there. We didn't have any close air support available, so I whipped my trusty AR-15 [assault rifle] out and I killed those three sons of bitches and stopped that silliness."[283] Madden's use of a personal firearm sounds extraordinary, but many FACs recall firing assault rifles, pistols, grenade launchers, and hand grenades out open side windows suggesting a tremendous level of emotional involvement in the battle, to the point pilots jeopardized their own lives in attacks of considerable danger and questionable utility.[284] In February 1967, O-1 pilot Hilliard Wilbanks detected and spoiled an ambush poised to strike an ARVN Ranger unit. Unable to obtain timely fighter support, He expended all his smoke rockets to delay the enemy troops. Wilbanks then followed his rocket passes with multiple passes at about one hundred feet with his M-16, reloading between runs until he was mortally wounded and shot down.[285] On January 24, 1968, (in the midst of the Tet

---

[283] A 12.7 millimeter machine gun constituted a terribly lethal threat to an unarmored forward air control aircraft and pilot. Madden, interview, 18.

[284] Arming hand grenades in the cockpit was very dangerous. To ensure the grenades did not explode until they hit the ground, FACs armed them and then placed them into a sealed glass jar which would then shatter upon reaching the ground. Peanut butter jars were the right size, and were referred to as "Skippy bombs," named after a popular peanut butter brand. William Anderson asked his mother to send him pint jars for the purpose. The security of a loose glass jar and armed hand grenade in a maneuvering aircraft elevated the risk of this weapon and tactic. Anderson, interview, 20.

[285] Donald K. Schneider, *Air Force Heroes in Vietnam*, USAF Southeast Asia Monograph Series (Maxwell Air Force Base, AL: Air University Press, 1979), 16-18.

Offensive) Wilbanks' widow Rosemary received a posthumous Medal of Honor for her husband's actions.[286]

Risk, Authority, and the Line at 1,500 Feet

Wilbanks' award highlighted a dilemma within the FAC communities in South Vietnam. Commanders at the squadron and wing levels attempted to limit the risk to their aircrews by imposing a minimum altitude of 1,500 feet for FAC operations. There were few guns of thirty-seven millimeter or larger caliber (which posed considerable threats well above 1,500 feet) in South Vietnam in 1968, and the risks posed by small arms and machine guns dropped off considerably above 1,500 feet due to their limited range and lack of computing sights. This comparatively safe altitude, however limited the FAC's potential mission effectiveness. Most significantly, the FACs believed they could not see the enemy adequately from altitude. Richard Griffin observed that new pilots flew at 1,500 feet until gaining enough experience to understand its limitation: "you don't know the best way to do it and so you're sort of trying to go by the book and figure it out. And then you suddenly find out that you can't see anything from 1,500 feet." Griffin noted that FACs then flew at lower altitudes, until the end of a one year tour, at which point some believed their duty was complete and became less interested in taking risks. [287] William Kurtz recalled that "we needed to get much closer to the ground if we were going to produce any useful information from our VR [visual reconnaissance]. [288] Even the "FAC

---

[286] "Widow of Air Force Pilot To Get His Medal of Honor," *New York Times*, January 24, 1968.

[287] Griffin, interview, 70.

[288] Maj William M. Kurtz, interview by Capt Kenneth J. Alnwick, June 25, 1970, 3, Air Force Historical Research Agency, Maxwell AFB, AL.

Procedures" pamphlet officially conceded in writing that "some targets require closer scrutiny than is possible at 1,500" feet.[289]

Despite the adverse mission impact, commanders reinforced the altitude limits. FAC squadron commander Lt Col John Welch believed the 1,500 foot restriction was necessary to protect his pilots.[290] OV-10 FAC Marshall Harrison arrived in Vietnam as a major, and served as the detachment commander of several FAC organizations in support of U.S. Army units. Early in his tour, a fellow pilot warned him not to fly below 1,500 feet where superior officers would see it, and to be wary of unidentified FAC aircraft in the area since they could be squadron or group commanders monitoring operations and checking for conformity with directives.[291] The altitude directive was almost universally disregarded through 1968 and pitted the field against headquarters. O-2 FAC Tom Yarborough recalled on a mission across the border into Laos that "everybody had preached the same sermon: 'Thou shalt never fly below fifteen hundred feet; always stay above the small-arms-effective range you'll live longer.' Yet in total disregard of that most sacred of FAC commandments, here we were skimming along the Ho Chi Minh Trail at treetop level in an O-2."[292] Most FACs found the 1,500 foot restriction impossible to abide by due to the inevitable mission degradation.

Heroic and exceptional missions became points of contention between commanders and the field because they illuminated the degree that FACs were violating directives. One of Mike Cavanaugh's lower-than-authorized flights was revealed to higher ups one day when he was the only FAC in the area to put in airstrikes when the area was blanketed by a 1,300 foot ceiling. His

---

[289] Churchill, *Hit My Smoke!*, 186.

[290] John F Welch, *My Year in Viet Nam* (Rapid City, SD: Silver Wings Aviation, 2005), 51.

[291] Harrison, *A Lonely Kind of War*, 82.

[292] Yarborough, *Da Nang Diary*, 95.

commander threatened to ground and then court martial Cavanaugh: "we found you out. You are the only guy who put in air strikes yesterday and that's because you flew below the ceiling." Cavanaugh unsuccessfully argued that since he was working troops in contact "that changes the rules." His commanders did not accept his point of view (regardless of any results from the mission), but he eventually escaped punishment when the local fighter units voted him "FAC of the year."[293] Richard Griffin highlighted the dilemma between the FAC's perspective of the mission and headquarters perception of risk by citing Wilbanks' last mission when he was shot down at low altitude. "Of course that's the stuff Medal of Honor winners are made of but he was doing exactly what the book said you weren't supposed to do. And he kept shooting. But the guys on the ground said if he hadn't done it that they would have lost that battalion."[294] Similarly Col Alonzo Walter submitted a decoration for heroism for one of his pilots to the overall FAC headquarters in Southeast Asia, the 504th Tactical Air Support Group. The group leadership returned a reprimand since it was evident from the citation that the pilot's actions included flight below minimum altitudes to suppress enemy gun positions in support of an air strike. Walther rebutted by citing the actions of Maj Bernard Fisher, the Air Force's first Medal of Honor recipient of the war, who landed his A-1 Skyraider at an enemy held airstrip to rescue a fellow aviator. "I'm sure that in that case Major Fisher violated several regulations, such as landing at an unprepared field, etc., etc., etc. By and large, if everybody adhered to the letter of every flying regulation, I don't think we'd have a h--- of a lot of awards."[295] This dispute between the field and headquarters underscores divided loyalties: the pilots on the line became deeply committed to

---

[293] Cavanaugh, interview, 146-147.

[294] Griffin, interview, 95.

[295] Col Alonzo J. Walter, interview by Capt Richard B. Clement, July 28, 1970, 44, Air Force Historical Research Agency, Maxwell AFB, AL.

their mission and felt a sense of duty and obligation to those they supported on the ground. Commanders were committed to preserving their forces at the cost of mission effectiveness. This may have been motivated by a commitment to the safety of their own men, but some subordinates feared that the motivation was for the good of their own careers to keep losses low for a positive performance report. It may have also been because commanders did not find the connections to the mission that their men did because they did not fly the sectors every day.

The freedom from close supervision afforded by small distributed FAC detachments and solo flying was satisfying, but could be dangerous. Air Force flight regulations evolved over the years in an attempt to make reasoned trade-offs between the inherent risks of flying and the mission. Many pilots believed that normal peacetime regulations did not apply to wartime because lives were on the line. The risk-reward balance needed for wartime missions was, in theory, governed by the same rules as peacetime training, but many on the line thought that in wartime there needed to be a different balancing point (hence Cavanaugh's comment that troops in contact "changes the rules"). To FAC Michael Morea, a casual attitude towards flight regulations began with his stateside FAC checkout in 1966. His instructors "loosened up on the rules quite a bit, basically they said, look you guys are going into a combat environment, it's time to forget Air Force regulation 60-16, which is the basic flying regulation for the whole Air Force." The attitude espoused in this final pre-combat training course held that if "you want to fly at fifty feet, fly at fifty feet, you want to fly the airplane slow, fly it slow.…Rules in combat are a little different than rules somewhere else anyway, they're rules of thumb I suppose, or at least that's the way most of us looked at them, to be abided by whenever possible."[296] This was a dangerous attitude since the rules were grounded in the hard and regularly fatal experiences derived from

---

[296] Morea, interview, 60-61.

decades of flying. Division ALO Stuart Kane reflected that flying accidents, often pressured by an elevated sense of mission, could have been avoided through better flight discipline and adherence to basic flight regulations.[297]

Many pilots on the line considered an undue concern for safety or placing risk avoidance above mission unmanly. Marshall Harrison, as many other pilots, believed that flight at treetop height was the best way to minimize risks below 1,500, but it could not be accomplished in half-measures. "Everyone but headquarters agreed that treetop flying was about the safest place when taking ground fire. This reduced the gunner's tracking time tremendously. You just couldn't be a pussy about it though; you really had to get down to where you were just clearing the trees."[298] William Tilton believed that his squadron commander and other senior officers in the unit undermined the squadron's aggressiveness and mission focus with conservative flying and a non-tactical focus: "later in the year we had some more senior people come in. We younger people didn't admire them very much. We called them old women, and they were not interested in tactics; in fact, they disbanded the tactics board."[299] Others tied manliness to one's willingness to accept risk and to the privations endured at forward remote strips. Mike Jackson saw a sharp divide between his experiences and those of airmen and soldiers living on large, comfortable, and relatively secure headquarters or air bases. By using the popular pejorative "REMF," which stood for rear echelon mother fucker, Jackson voiced his distrust and questioned the manhood of those fighting the war in comfort: "REMF-related decisions often confounded our efforts" (in the field). To Jackson, REMFs included squadron and group leaders whom he resented for their relative

---

[297] Kane and Sheets, interview, 12.

[298] Harrison, *A Lonely Kind of War*, 14.

[299] Tilton, interview, 71-73.

lack of privation. Those unable or unwilling to endure hardships at the front were labeled "panty wastes."[300] One line of thought held that since many commanders flew from major bases in relative comfort, they could be feminized and their opinions did not count among those more masculine warriors on the front line. One's masculinity should be proven to one's peers in spite of headquarters.

Mission justification for increased risk-taking, however could not be applied to flying risks unrelated to the mission. The casual attitude towards flight restrictions bled over into non-mission aspects at some of the isolated FAC bases, far from headquarters' scrutiny. Some pilots took the freedoms of flight to dangerous extremes in the minimally supervised FAC environment and had to be reined in. Tom Yarborough candidly recalled committing and observing routine unauthorized low level buzzing and aerobatics. Several actions included buzzing friendly hilltop positions and beaches, buzzing an international ship and performing low level aerobatics, and doing a touch and go on a besieged airstrip in the midst of a battle as a rites of passage exercise.[301] William Tilton recalled an infamous incident where an inebriated FAC attempted to fly an O-2 following his farewell party and was killed just before rotating home.[302] The C-130 crews (as discussed) enjoyed a similar degree of autonomy, but because their aircraft were flown by crews, mutual surveillance was likely to have limited many wild and unwarranted excursions

---

[300] Interestingly, Air Force FACs had to wage a parallel conflict with Army commanders to preserve any living standard improvements they were able to eke out of their surroundings relative to their Army partners. Jackson, *Naked in Da Nang*, 147, 240.

[301] Yarborough, *Da Nang Diary*, 84, 117, 152, 219.

[302] Tilton, interview, 35.

outside the flying rules.[303] Single-seat FACs had a free license to fly as they wished without oversight or mutual surveillance.

Higher headquarters commanders and staffs assumed an enforcement role pitting them against the crews and threatening their autonomy. Stanley Beck, an OV-10 operations officer (and former SAC pilot) took away the need to enforce strong safety and standardization programs as the most important lesson from his year-long FAC tour. Beck's SAC background ensured he saw regulation and standardization as the keystone of any flying program as it was in SAC. He believed that "strong training and guidance for flying safety" could avert unnecessary flight mishaps."[304] Although many pilots railed against any limitations on their autonomy, Tom Yarborough adopted a more circumspect and mature perspective on the need for flight discipline as a check on freedom, and he accepted the need to reinforce it. Mid-tour evaluation flights (a check ride) was one method: "most of us considered the check ride a waste of time and an insult to our prowess as pilots. But there was a good reason for our suffering the indignation. Our leaders saw what we couldn't. For six months the individual FAC had been a free spirit, answering to nobody and generally accustomed to having his own way. At that point we thought we knew it all, that we could handle anything." Yarborough acknowledged that his commanders were more experienced and had something to offer. "Our bosses knew better. They had gone through the same euphoric stage years earlier. They knew that young pilots were most prone to get in trouble early in the combat tour when they were green and at the six-month point when they were cocky. The mid-tour check was a scathingly brilliant way of pulling in the reins."[305]

---

[303] The C-123 crew that tried to snare the panties from the pole and the C-130 flight evaluator who buzzed the South China Sea recounted in the Tactical Airlift chapter are presumably rare exceptions.

[304] Maj Gen Stanley C. Beck, interview by Lt Col Walter R. Berg, January 14, 1988, 58, Air Force Historical Research Agency, Maxwell AFB, AL.

[305] Yarborough, *Da Nang Diary*, 177.

Frictions between headquarters and the field were heightened when senior leaders were perceived as not flying dangerous or complex missions, or enduring the same hardships. Beck recalled flying once a week due to his responsibilities as operations officer. This was a very low flying rate (since line FACs flew nearly every day for a year), and likely prevented the operations officer from effectively circulating to all the squadron's operating locations. This low rate of flying also precluded sufficient flying proficiency to direct complex missions—especially troops in contact. Since troops in contact missions taxed the pilot to the utmost, and forged the most powerful bonds between FAC and ground units (which was central to a FAC's perception of his mission), commanders and staff who did not participate in the harrowing troops in contact missions might not gain the same appreciation of mission common to their subordinates. Marshall Harrison assessed that his squadron commander and safety officer had never handled a troops in contact situation and their adherence to the rules was uninformed by the necessities of battle.[306] Mike Cavanaugh believed his commanders were not fighting the same war. When Cavanaugh was grounded for flying below the 1,300 foot ceiling, he noted "the thing was, *he* was in an air-conditioned trailer" suggesting his superiors were out of touch with realities in the field.[307]

Motivation: "We Were the Difference"

Initial motivations towards forward air control duty varied among Air Force pilots, but all found the experience personally rewarding and motivating. The men assigned to fly as FACs wanted to fly, and to apply the power, control and freedom of flight towards a mission that would make a difference in the war. The relative freedom FACs experienced over South Vietnam was

---

[306] Harrison, *A Lonely Kind of War*, 154.

[307] Author's italics. Cavanaugh, interview, 147.

motivational, but the strongest motivations grew from the connections these men developed with soldiers on the ground. When airmen applied their unique expertise to call in immense aerial firepower and saved the lives of friendly forces on the ground, they were willing to accept immense risks on their behalf and violate risk-limiting directives of their commanders.

Although some pilots were initially reluctant to go to Vietnam as Forward Air Controllers, others were eager to fly in the war as a FAC. Fighter pilots expressed reluctance or disappointment because they could not fight in high performance jets that they loved and trained in. Some fighter pilots took FAC assignments as an alternative to other less attractive options. A FAC tour provided a route back into the cockpit from a non-flying staff position; it could also provide a means to avoid an unappealing back-seat tour in the F-4 where they would not be in control. Thus, flying, and being in control—key attractions of flight since pilot training provided some attractions to the FAC role. Bomber and transport pilots expressed a variety of reasons to fly as FACs, many cited the ability to "get into" the war, or to fly a more exciting mission than they were accustomed to. Others saw the opportunity to advance their careers with a few hundred hours of combat time and a chest-full of Air Medals.

None went because they were attracted to the FAC aircraft. The low performance O-1 and O-2 were not attractive aircraft, nor inspiring in their aerodynamic performance. Bird Dog, Oscar Duck, Suck and Blow, and Flying Speed Brake were not terms of great affection. C-130 pilot Charles Lippe quickly mastered his O-2, but was not impressed by the machine in any way. "The O-2 was pretty simple. Let's face it; it was designed for a little old lady to fly from LA to Las Vegas for a few rounds at a slot machine. It wasn't designed for a combat aircraft."[308] The workmanlike OV-10 had more favorable aerodynamic performance some likened to a World War

---

[308] Charles Lippe, interview by Stephen Maxner, September 22, 2001, 11, The Vietnam Archive, Texas Tech University.

II fighter, but it didn't inspire men to become FACs in order to fly it, as was the case for most fighter jets.

Regardless of their initial motivation to fly a small light aircraft in combat, the vast majority of FAC memoirs and oral histories register tremendous satisfaction from the experience because of the freedom and local control inherent to the FAC mission rather than any association with the aircraft. This was unlike many fighter pilots, whose identity was often inseparable from their aircraft. Before his heroic action as a FAC at Dak To, Joe Madden was a fighter pilot who had also flown bombers and transports before the Air Force assigned him to Vietnam in the O-1. He expressed some initial displeasure with his assignment: "I was zapped as a FAC and sent to Southeast Asia." But Madden, as the majority of his peers, found that flying as a FAC was a very positive experience. "As it turns out, that was probably the—well, without a doubt, it was the most rewarding assignment that I have ever had as far as personal satisfaction, mission, [and] sense of accomplishment of what you were doing."[309] The FAC's "sense of accomplishment" stood apart from many fighter and bomber experiences in Vietnam. Madden and his FAC peers could see meaningful results of his actions as a FAC in terms of friendly lives saved and enemy destroyed, while fighter and bomber crews could often note little more than the impact of their bombs without any significant meaning or results tied to them. The sense of accomplishment appealed to the pilot's desire to win and satisfied the obligation to use their skills and power to help friendly forces because FACs could see the positive impact of their missions on the larger war.

Like crews from other aircraft types in Southeast Asia, new FACs went through an in-theater orientation course to build some experience and self-confidence before flying in heavy

---

[309] Madden, interview, 1.

combat. Theater orientation rides helped ease initial apprehensions and fear. Already fairly confident in their simple FAC aircraft, newcomers to battle learned some basics that added to their U.S. training at a centralized FAC school irreverently called "FAC-U" set up at Phan Rang Air Base, Vietnam. Each pilot got four to eight orientation flights with experienced FACs in the back seat (or right seat for O-2s) and academic briefings to provide better theater-specific background.[310] After FAC-U, pilots reported to their units spread throughout South Vietnam or Thailand, where they flew additional sorties with experienced pilots to acclimatize to the local area, become familiar with friendly and enemy locations, radio procedures, call signs, and local fighter aircraft and units. Familiarization and experience quickly turned into confidence.

Once a new FAC acclimatized to the war over South Vietnam, he became deeply committed to the mission and most took substantial risks in his small, weak, and unarmored airplane. A substantial aspect of combat motivation, experienced during the heat of battle, sprang from the FAC's intense workload while directing air strikes. The technical demands of managing three radios, positioning the aircraft, and monitoring the air and ground situations crowded out apprehension during a battle. Put simply, FACs running air strikes were too busy to be scared and to act on their apprehensions. Bird Dog FAC Gary Cooper was fully engaged in a directing air strikes during a dramatic night-time troops in contact situation over the Mekong Delta, aware but seemingly unaffected by nearby ground fire as he dove on enemy positions. He had a back-seater (an experienced fighter pilot new to the FAC mission) riding along to gain some experience in the local mission, and his experience provides an important contrast. The back-seater was neither in control, nor as involved in the direction of the hectic battle as Cooper, nor did he have any mission-essential tasks to complete (as a navigator on a multi-place aircraft), so he voiced

---

[310] Lt Col Ray Janes, interview by Stephen Maxner, March 7, 2003, 65, The Vietnam Archive, Texas Tech University; Lippe, interview, 12.

protests over some of the more daring and risky actions. “Despite protests from the back seat, I lined the aircraft up for the next rocket strike. I think Major Nelson was feeling rather vulnerable and wishing he was elsewhere.”[311] Little more than a spectator, Nelson lacked the involvement that spurred on Cooper in the front seat, and it was Cooper’s flying skills and expert control of air power that would win the battle.

Experience and successes in battle continually built up self-confidence and a growing sense of control which served to bolster motivation in battle. Kenneth Johnson, who flew both the O-1 and the F-100 in South Vietnam, believed fear went away after a month. “Fear is of the unknown. When I went over there, I was scared. I hope anybody that goes into combat the first time is scared. After doing this day after day and mixing up and getting in combat, about thirty days later complacency is your biggest enemy. Fear goes away.” For Johnson and many other aviators, overconfidence could set in after experiencing a string of successes in battle. “I used to say that when I looked at the dangers that the greatest danger was complacency. The next greatest danger was Army artillery and, finally, the enemy was the third in dangers. That’s one thing that was awful easy whenever you were flying every single day, to get complacent.”[312] With South Vietnam’s relatively low threat level compared to that experienced in Rolling Thunder, aviators could become dulled or insensitive to increased risks, leading them to inadvertently take greater and greater chances without accurately assessing them.

The most powerful combat motivation sprang from a sense of duty and obligation to use the FAC’s power and control to protect soldiers (or downed airmen) through his unique capability to call on and direct tremendous firepower. FAC narratives recall these support missions in the

---

[311] Garry Gordon Cooper, *Sock It to 'em Baby: Forward Air Controller in Vietnam* (Crows Nest, N.S.W: Allen & Unwin, 2006), 13.

[312] Johnson, interview, 57.

most positive terms of all other missions. When friendly troops were in danger, expert actions by forward air controllers saved American and ARVN lives. Richard Griffin assessed that "we were the difference….The Air Force was the difference…and as a result we felt much more responsible for them."[313] Successful direction of close air support for troops in contact provided immediate and powerful feedback. FACs could measure their contributions to the war in American lives saved and received the respect and praise of soldiers they supported. Nearly all FAC narratives feature heartfelt thanks passed over the radio by small unit ground commanders in the aftermath of desperate battles saved by close air support. Joe Madden expertly supported the Dak To battle, that was so close he repeatedly called between napalm runs to ensure the ground troops were OK: "The Company Commander replied that he couldn't see anything because of the heavy white smoke, but would have his platoon leader talk to me. The platoon leader's comment was: 'Beautiful. I stomped the fire off my boots [from the napalm] and we are all okay.'" Madden derived a great deal of his purpose from American lives saved: "There's no doubt in my mind that there's an awful lot of American boys home that wouldn't be here if it hadn't been for the United States Air Force. Everybody gets all twisted about body count. Southeast Asia was a body count paradise. That isn't why I was over there. I wasn't over there necessarily to kill a lot of NVA or South Vietnamese peasants, not that I give a rat's ass about the NVA. They were my enemies, and I killed them every chance I had. But my mission in Southeast Asia was to make sure that those people paid a price and, more importantly, make sure that the American people were going to be given all the support and allow more of them to come home safely."[314]

---

[313] Griffin, interview, 129.

[314] Madden included two handwritten letters in his oral history file from the survivors of Dak To indicating the level of appreciation and gravity of the mission. One was signed by ten soldiers dated November 19, 1967: "To: The Air Support. The men of 'D' company 3/8, and especially the 2nd plt. of 'D' Co., sure appreciate the air support that we received during the period of time from the 14th of Nov. thru the 12th of Nov. It sure did look good when you layed [sic] your stuff on the NVA. It sure was amazing how close to

The life-saving actions of close air support missions provided the most clear-cut affirmation of pilot actions in Vietnam and provided a counterbalance to the psychological tolls of killing imposed on FACs due to their proximity to the battle. Several FACs extended the saving aspect of their missions to a larger mission of saving the South Vietnamese people and helping the people defend themselves which Richard Stoner described as "a very gratifying, satisfying experience."[315] When this saving mission conflicted with the destruction of the war, pilots transferred authority to the operation of the overall system, where responsibility was diffused between the Vietnamese province chief, commanders on the ground, and the rules of engagement which contained no-strike areas and free fire zones. This diffusion of authority provided a sense of legitimacy and a potential haven for conscience.

The FAC's powerful sense of duty to support the men on the ground, and dangers sensed against those troops spurred many pilots to put themselves at very high risk, even to the point of using their personal weapons as already noted. In these cases, the FAC was at a great disadvantage, but when Madden and Wilbanks famously fired their assault rifles out the window, they had no other air available at a critical moment and felt obligated to make due with whatever they had. FACs and their commanders knew the risks. Squadron commander John Welch reminded his FACs of the risks when he heard about Wilbanks' last mission: "I had told my FAC's not to try attacking ground forces, the odds would be against them. I surely did not want to lose any of my men."[316] Welch demonstrated his loyalty to his pilots, but they felt loyalty to the troops they supported on the ground. Welch's direction might make sense in the cool reflection of

---

our perimeter you could lay the napalm bombs. It sure was great work. Thanks for a job well done.–The ones who made it back from the 2nd plt, D Co. 3/8." Madden, interview, 51-52, XII 1-4.

[315] Anderson, interview, 6; Morea, interview, 34-35; Stoner, interview, 18-19.

[316] Welch, *My Year in Viet Nam*, 155.

a squadron meeting, but his FACs disregarded it once their sense of duty became activated in the air, and they felt they had to use what they had to do what they could. Although Tom Yarborough repeatedly heard the "sermon" to remain above 1,500 feet, his sense of duty to men on the ground made him and his peers sinners in the eyes of those in authority.[317]

Like commanders in Rolling Thunder, FAC commanders at all levels had the difficult responsibility to mitigate risks to their pilots and to uphold flight discipline, but unlike Rolling Thunder, FAC commanders had to do so through a distributed system widely scattered across many forward airstrips. Local detachment commanders chose to either side with the attitudes of the pilots on the line or with headquarters' directives. The degree that commanders identified with risk avoidance or mission effectiveness may have been closely related to the amount of flying they did and their proximity to the mission. As squadron operations officer, Stanley Beck admitted to flying very little and emphasized safety and standardization, while Marshall Harrison, a local detachment commander, flew nearly every day and had to hide his bold flying from his bosses.

Duty to those on the ground provided a powerful sustaining motivation, returning FACs to the air, sometimes in battles extending across days or weeks. FACs flew over the siege at Khe Sanh continuously from January to April, and pilots worked the same areas for weeks. Seventh Air Force's airborne controllers (call sign Hillsboro) singled out one FAC from Danang for directing streams of fighters in a three-day battle effort against PAVN supply area at Khe Sanh: "I would like to commend Covey 673 for the outstanding FAC job he has done the last three days. It is the best I have seen in the 20 months I have flown Hillsboro."[318] As already noted, Joe Madden

---

[317] Yarborough, *Da Nang Diary*, 95.

[318] Trest, *Khe Sanh (Operation Niagara) Vol. 1*, 55.

earned the Air Force Cross for the sense of duty and responsibility demonstrated in directing U.S. firepower over an extended five-day battle.[319]

A FAC's freedom and autonomy was immensely satisfying, but it also provided some an opportunity to avoid combat. Solo missions and remote operating strips afforded significant freedom for young pilots. In the air, there was little oversight and the most junior pilots flew where they chose, made decisions on friend or foe, and demonstrated independent flying and thinking skills by orchestrating the efforts of strike aircraft and directing aerial attacks. This freedom was immensely satisfying to practitioners of a discipline founded on leaving the confines of earth and enjoying the freedoms of flight. John Stoner described the autonomy in glowing terms: "you can talk to any person who's been a forward air controller in Vietnam and he'll walk with his head high because he had the best job he's ever had in his life, He's a captain; he's made decisions that he won't make again until he's a colonel."[320] Ray Janes, an OV-10 FAC, enjoyed the authority he exercised over the battlefield. While directing air strikes, the fighters were completely subordinated to the FAC's directions. FACs could and did direct poorly performing pilots to leave the battlefield in shame. "Quite frankly, it was the best job in the Air Force at that time. Because you were the boss of the battlefield. If you told a two star general that he was having a lousy day and go home, he had to carry his bones back home."

Some pilots took advantage of the freedoms of flying as a FAC to avoid risks and heavy combat. Mike Cavanaugh believed the major in charge of his detachment used his freedom from oversight to intentionally avoid combat: "when he flew he wasn't flying. He would go up, fly around in circles, and come back and land. If he even did that. I swear he logged time without

---

[319] "Valor awards for Joseph B. Madden: Military Times Hall of Valor," accessed March 6, 2010, http://militarytimes.com/citations-medals-awards/recipient.php?recipientid=3582.

[320] Stoner, interview, 18-19.

ever flying." Cavanaugh was a very aggressive veteran of three FAC tours in Southeast Asia and thought that many pilots limited their risks by flying cautiously or aborting. "They would say, 'Oh, the weather is bad. Oh, the airplane is broke.' There is a lot of that. Guys would go over and do the minimum or they would do their best with doing the very least."[321] After flying O-1s, Kenneth Johnson flew F-100s in South Vietnam and laughed at an instance where a FAC controlled his F-100 strike from an impossibly high (and presumably ineffective) altitude: "I was always very conscious to see where the FAC was before I went in." He could not find the FAC and said, "'I don't have you,' and he said, 'You're clear.' I went in about three passes" and then found the FAC "He was at 10,000 feet. [laughter]"[322]

Some fighter pilots who flew as FACs attributed unaggressive behavior to transport and bomber pilots trained into the FAC mission. Johnson noted that he sometimes "put in more air strikes in a day" than some non-fighter FACs "put in for six months." Although Johnson believed fighter pilots were more aggressive, he conceded that non-fighter FACs could draw duty in quiet sectors. "You could just go out there and VR and not get any air strikes. Some places were extremely active and other places were extremely slow."[323] Given equal opportunities, other pilots believed there was no difference between pilots. Because aircraft proficiency in the simple FAC aircraft presented few problems to any Air Force pilot, personal commitment and personal sense of obligation could connect with the pilot's strong will to win. Richard Griffin flew the O-1 after assignments in Air Defense Command as an interceptor pilot and observed that that the "difference between pilots [from different major commands] is really awfully small." The senior

---

[321] Cavanaugh, interview, 58-59, 72-73.

[322] Johnson, interview, 56.

[323] Ibid., 55.

FAC in Griffin's sector "was one of the coolest troops under fire I've ever seen, he…had never flown anything but SAC bombers. And, of course, hell, I had my prejudices against anybody that flew bombers, you know.… But, one of the main reasons that I lost those prejudices was what I saw of those troops in Vietnam flying as FACs. I tell you, there's no way to tell the difference. There was just no way to tell the difference."[324]

Several other appeals appeared to have provided sustaining motivation. Several pilots noted the growth as aviators that they experienced as FACs. Continuous learning served to make pilots better warriors and aviators, appealing to a pilot's desire to be the best. Several FACs valued their proximity to the ground action and fuller insights they gained into the war. Richard Griffin reflected that "you wouldn't trade with anybody's experience. Primarily because you did get so much closer to the war. You could see what was going on." He compared his experiences to a fighter pilot's and thought he learned more from the wider range of responsibilities—as the FAC, he picked the targets and placed the smoke for the fighters. "They'd say…I stayed over there all year and all I did was drop bombs at the smoke and never did really talk to the Army guys. Never even saw a Vietnamese up close. And it's just different. I feel like I really learned something being a FAC."[325] John Stoner also valued his learning as a FAC, "It's a good education for them [FACs], They could see the results of what they were doing." Stoner also took personal pride from enduring difficult conditions as a FAC. He derived honor from hardship, especially in comparison to the fighter pilot's experience that was more distant and detached from the war in the bush. As already noted, Stoner believed "it didn't take over a couple or three weeks over there in combat before [FACs] were the proudest men I think in South Vietnam" especially when

---

[324] Johnson, interview, 55-56; Griffin, interview, 21-22.

[325] Griffin, interview, 125-126.

compared to their fighter-flying peers: "I think the man who felt the fighter pilot was up there delivering the ordnance and going home and sleeping in clean sheets instead of sleeping in the mud with the Army really didn't understand the problem as well as he did."[326]

The FAC detachments spread throughout the theater provided an opportunity to form socially cohesive groups. Since most FAC tours were one year long, there was ample continuity to form close personal friendships within most FAC detachments. Drinking and fellowship characterized much off-duty time and provided a supportive community for FAC pilots. Social cohesion, however, was less important in combat because FACs generally flew solitary patrols. They tried to maintain connections throughout the mission over the radio back to their home base, with fighters in the air, and with supported units on the ground. Many FAC detachments were co-located with Army brigades, which provided opportunities to forge personal relationships between FACs and the Army officers they supported, that may have been more relevant than cohesive pilot relationships due to the strong connections between airman and soldier already discussed. These personal relationships were helpful, but not indispensible to motivate high performance, as FACs carried out countless heroic acts in support of units that they did not know.

Although the FAC mission provided powerful sustaining motivations, most pilots went back to their prior flying communities after a FAC tour in Southeast Asia. Some volunteered for additional FAC tours—Mike Cavanaugh flew three tours in Southeast Asia as a FAC, including a one-year tour as a FAC for the CIA in northern Laos. Cavanaugh came from transports and his aggressiveness found a natural outlet in the control and freedom afforded the FAC mission. Most pilots returned to their communities despite the attractions of serving as a forward air controller. They returned to fly bigger and more powerful aircraft, and were willing to sacrifice some of the freedoms that they found as FACs. Kenneth Johnson saw that local fighter units were short of

---

[326] Stoner, interview, 16-19.

experienced fighter pilots and worked a swap back into F-100s from his FAC assignment after six months in theater. Although he valued both assignments, he did not see the FAC community as his home and was happy to return to fighters. "I definitely enjoyed both jobs. The personal rewards of flying as a FAC were far greater than flying in the F-100 and living right out there in the combat zone and being with it." Johnson saw himself as a fighter pilot and was eager to return to that role. "I definitely enjoyed the fighter business. That really had been what I had trained for initially in my career and I was really delighted to get out and do that."[327] The combat Johnson experienced as a FAC "living out there in the combat zone" and the autonomy he experienced were the experiences furthest from those of his fellow Air Force aviators who flew the B-52 bombers over South Vietnam in operation Arc Light, the subject of the next chapter.

[327] Johnson, interview, 72.

Chapter 8: Operation Arc Light

Truong Nhu Tang, the NLF's justice minister, pressed himself against the walls of his earthen bunker as a cascade of bombs slammed into his insurgent base camp northwest of Saigon. For ten eternal seconds, a string of 108 five-hundred and seven-hundred-fifty-pound bombs tore through the camp, splintering trees, flattening structures, cratering the jungle floor, and burying insurgents in collapsed bunkers. "The first few times I experienced a B-52 attack it seemed, as I strained to press myself into the bunker floor, that I had been caught in the Apocalypse. The terror was complete. One lost control of bodily functions as the mind screamed incomprehensible orders to get out." Precisely five seconds after the last explosion, the first blast of a second, parallel string erupted alongside the first swath of devastation; and due to the Strategic Air Command's characteristic precision, a third string followed five seconds after the second. Truong and his peers often received warning of impending B-52 raids and made haste along jungle escape trails to safety in nearby Cambodia. But upon return, Truong sometimes found his "complex would be utterly destroyed: food, clothes, supplies, documents, everything. It was not just that things were destroyed; in some awesome way they had ceased to exist. You would come back to where your lean-to and bunker had been, your home, and there would simply be nothing there, just an unrecognizable landscape gouged by immense craters."[1]

Every day from March to December 1968, twenty formations of three bombers cut swaths of destruction like those encountered by Troung across South Vietnam, North Vietnam,

---

[1] Truong Nhu Tang, *A Vietcong Memoir* (San Diego: Harcourt Brace Jovanovich, 1985), 168.

and Laos.[2] Early in the year, the B-52 bomber force played a prominent role in the siege of Khe Sanh, helping to realize General Westmoreland's vision of a cascade of bombs in Operation Niagara. Formations of three B-52s arrived over Khe Sanh every hour and a half to rain ninety tons of bombs into target grids thought to contain PAVN troop concentrations, supply areas, and lines of communications. With their heavy payloads, each B-52 carried the bomb load of an entire fighter squadron, and a formation of three delivered the punch of an entire fighter wing, savaging the besiegers encircling the Marine outpost. Gen Westmoreland so valued B-52 participation in the war, he reserved their targeting for his own MACV headquarters, to the frustration of Air Force Gen William Momyer, his deputy commander for air. Westmoreland's control of the B-52 targeting fit hand in glove with SAC's insistence to keep the control of the heavy bombers independent from Momyer's Seventh Air Force headquarters in Saigon. These command arrangements insulated SAC crews from the Air Force headquarters in Saigon, while the technology of their big bombers isolated them from the destruction they delivered ten kilometers below.

Control, rather than violence, defined the experience of SAC's bomber crews in Southeast Asia, and separated their experiences from their partners flying fighters or FACs. Strategic Air Command reluctantly committed B-52s to the war in 1965, but once committed, SAC insisted on retaining control of them, citing the need to ensure they would be ready for higher priority nuclear missions—SAC's *raison d'être*.[3] Strategic Air Command's nuclear

---

[2] Arc Light sorties increased from nine-hundred per month in January to eighteen-hundred per month from March to the end of the year. Of the year's 20,620 sorties, 819 hit targets in North Vietnam and the DMZ, 3,351 hit Laos, and 16,450 struck the South. Maj James B. Pralle, *ARC Light Jun. 1967-Dec. 1968*, CHECO Contemporary Historical Evaluation of Combat Operations, August 15, 1969, Appendix 1, Air Force Historical Research Agency, Maxwell AFB, AL.

[3] This was a dubious concern since the Joint Chiefs of Staff or Secretary of Defense could have reassigned the bombers as needed. In a retrospective interview in 1979, Lt Gen Alvan C. Gillem, the SAC director of operations and deputy director of staff between 1965 and 1968 regretted SAC's insistence on control and

mission mandated a culture of centralized control, rigid discipline, and adherence to centrally developed procedures that extended into the cockpits of each B-52. Due to SAC's nuclear roots, B-52 crews did not experience the freedom of flight that their fighter pilot peers enjoyed nor did they experience the autonomy that their transport and FAC partners exercised. Instead, bomber crews wielded immense power, but were subject to intrusive oversight and distant control by Strategic Air Command generals. Designed to deliver nuclear weapons, SAC's B-52s also wielded the Air Force's most powerful conventional punch in Southeast Asia. SAC crews were proud of the power they wielded in their high-flying bombers, but they enjoyed the least freedom and agency of all flyers in Southeast Asia. SAC's tight control of the B-52's mission determined where, when, and how they flew, and even prescribed exactly how the aviators should interact with each other. In-flight each crewmember of these six-man bombers had very specific duties to accomplish, but SAC required them to adhere to a very formal script determining their interactions with little tolerance for deviation. How crews interacted with each other and their complex equipment in the B-52 will follow this chapter's introductory thumbnail history of Arc Light and the B-52's participation in Southeast Asia.

An assessment of the B-52's mission, risks, and the bomber crews' relationship with higher authority follows a description of what it was like for crews to fly the aircraft. The B-52's technology and SAC's strict control physically and psychologically distanced bomber crews from the effects of their bombing missions. Because the B-52 bombed from high altitude under radar direction, the crews were unable to observe the results of their air strikes, and they received very

---

not placing the bombers under the control of the Air Force's top airmen in Saigon. "If I had to vote over again, I probably would be inclined to give [control] to [Gen Momyer in Saigon]….We all work for the JCS. If they want to move [the bombers] out of there, they can move them out of there." Lt Gen Alvan Gillem, interview by Lt Col Arthur W. McCants, February 13, 1979, 152, Air Force Historical Research Agency, Maxwell AFB, AL.

little feedback through bomb damage assessments. Unlike the FACs who orbited over a target at low altitude, or even fighter pilots who pulled off a dive run and looked over their shoulder to judge the accuracy and effect of their bomb run, B-52 crews were largely unable to gauge the effects of their attacks, which frustrated many aircrews, depriving them of a potential source of motivation, but also shielded them from knowing the destruction that they caused. Despite their heavy bomb loads, crews doubted their efforts were making a difference to the war. SAC's bomber crews believed their personal efforts and sacrifices, which spanned multiple Arc Light deployments, did little more than make matchsticks out of jungle. Lacking external indications of progress towards the war, bomber crews turned inward for motivation and meaning through a validation of their efforts by judging how precisely they adhered to SAC's standard operating procedures. Throughout most of Arc Light, the bomber crews experienced relatively few external threats and did not face the profound choice between mission and risk that fighters and FACs grappled with. Most B-52 missions flew at high altitude over South Vietnam, far above any PLAF/PAVN air defenses. Throughout most of the war, midair collisions and mechanical failures posed the greatest threat to B-52 operations. Operational mishaps claimed twelve B-52s during the first seven and a half years of Arc Light. PAVN defenders did not shoot down their first B-52 until November, 22, 1972, when a bomber sustained a hit over North Vietnam between the two Linebacker Offensives (which are beyond the scope of this chapter).[4] Prior to the final assault on Hanoi, bomber crews were more fearful of breaking SAC directives or dropping their bombs off target than they were of the enemy defenses. SAC's zealous interest in standardization and adherence to central direction at times seemed to resonate with Frederick the Great's maxim that

[4] Linebacker I ended in October 1972, and Linebacker II started December 18, 1972. Hobson, *Vietnam Air Losses*, 240, 257.

soldiers "should fear their officers more than all the dangers to which they are exposed."[5] Until Linebacker II, SAC crews were not worried about being killed; they were worried about criticism from commanders and their staffs. Most Arc Light missions began and ended at Anderson Air Force Base on Guam and lasted twelve to thirteen hours.[6] Because crews flew these exhausting missions from Guam for months on end, the greatest short term motivational challenge to SAC crews in Southeast Asia included fighting the effects of long-term fatigue; while over the long-term, commanders had to consider how to keep SAC crews in the Air Force with Arc Light rotations on the horizon as far as one could see. How the bomber crews found sustaining motivation to conduct their grinding campaign of endurance for two, three, or more combat rotations over the seven year campaign concludes this chapter and case study.

Arc Light

Strategic Air Command moved two squadrons of bombers, thirty B-52Fs, to Anderson Air Force Base, Guam in February 1965, in response to insurgent attacks in South Vietnam. Headquarters in Saigon, Honolulu, Omaha, and Washington considered the B-52s for the initial raids on North Vietnam, but the bombers waited in Guam as Air Force and Navy fighters launched the early raids that became Operation Rolling Thunder. After watching from the sidelines for four months, the B-52s sallied from Guam against a target in South Vietnam on June 18, 1965. Thirty heavy bombers launched to strike a suspected insurgent base area north of Saigon, but tragedy and controversy marred the B-52's introduction to combat. Pushed ahead of schedule by unexpected tailwinds, the first cell of three bombers elected to circle in the darkness north of Luzon to correct their timing and collided with a cell following several minutes behind

---

[5] Jay Luvaas, *Frederick the Great on the Art of War* (Da Capo Press, 1999), 78.

[6] SAC crews flew shorter missions from U-Tapao Thailand starting in 1967, and Kadena Okinawa in 1968.

them. Two of the big bombers exploded and crashed into the sea, and only four of the twelve crewmembers survived. Crash survivor Don Harten wrote that "trailing B-52 cells saw the explosion as far away as two hundred miles." Seconds after the impact, Harten recalled, "we were going straight down. The right wing had exploded and blew away because it is one gigantic fuel tank."[7] Shaken, the crews of the remaining bombers went on to the target but achieved awful results, with only "slightly more than half" of the thirteen-hundred bombs landing within the two square mile target box.[8] SAC acted quickly to improve accuracy, and the fear of dropping outside the desired target box overshadowed fears of enemy action, or even the fear of mishaps, which signified the main threat to B-52s through the first seven years of the war. Between June 1965 and October 1972, ten more bombers would crash or be destroyed due to operational accidents without suffering any losses to PAVN defenses.[9]

B-52 operations, named "Arc Light" increased steadily thorough 1965, reaching three hundred sorties per month in September. As the war escalated, SAC added bombers to Guam, more than doubling the sortie rate to 650 by the end of 1966. The long missions from Guam, often exceeding eleven hours, limited the B-52's sortie rates, and in April 1967 American

---

[7] Harten recalled that "the impact itself jarred our plane about the same as if we'd driven a car over a large pothole in the road going about thirty miles per hour. Our right wing, in the drop tank area, impacted the base of their tail, the thousand mile an hour speed slicing through rather than crunching, like two cars head on. Our cockpit went totally black and for a moment I waited for death....the explosion became the brightest thing I'd ever seen. Of course, I was at the center of it." These were the only two B-52Fs lost in Southeast Asia. Knaack, *Post-World War II Bombers*, 2:269; Don Harten, *Arc Light One*, Limited ed. (Paducah, KY: Turner Pub, 2003), 67.

[8] One bomber diverted prior to reaching the target, and one did not drop due to a bomb-bay malfunction. Twenty-six B-52s dropped their bombs into a two by four kilometer target box. Robert M. Kipp, "Counterinsurgency From 30,000 Feet-the B-52 in Vietnam," *Air University Review* (February 1968); Schlight, *The War in South Vietnam*, 52.

[9] Lake and Styling compile B-52 losses by aircraft serial number. There is only one disagreement between Lake and the comprehensive numbers compiled by Chris Hobson. Lake lists a loss at Kadena AB on December 3, 1968. Several accounts attribute this loss to a ground fire (so it is not used in the overall numbers here because it likely did not involve aircrew actions). Jon Lake and Mark Styling, *B-52 Stratofortress Units in Combat 1955-73* (Westminster, MD: Osprey, 2004), Appendix B.

bombers began operations from a second location—U-Tapao Air Base, Thailand. These relatively short-range missions from Thailand took four hours, did not require aerial refueling, and enabled B-52 sortie rates to reach eight hundred per month. SAC opened a third bomber base on Okinawa in 1968 which enabled the B-52 sortie rate to reach 1,800 sorties per month, just in time for Operation Niagara.[10] SAC sustained this peak rate for a year and a half. Each bomber carried up to thirty tons of bombs per sortie during this peak, raining down a staggering fifty-four thousand tons per month.[11]

Brute power defined the B-52 bomber: it flew higher and faster than any other existing bomber. Its eight jet engines and huge swept wing lifted 225 tons—nearly a half-million pounds—into the air. The B-52 first flew in 1952, and was officially named the Stratofortress, but its crews came to unofficially call it the BUFF, which stood for Big Ugly Fat Fucker (or Fellow for gentler audiences) and quickly became the centerpiece of SAC's bomber force.[12] Its unique combination of long range, high speed, and heavy payload struck an optimal balance not achieved by older propeller-driven bombers or early jets, making it ideal for SAC's cold war nuclear mission. SAC fielded seven versions of the B-52, from the B-52B to the B-52H, and each model was different enough from the others to require model-specific classroom and flying training—which impacted SAC's crews during Arc Light because SAC ultimately optimized one

---

[10] Japan granted B-52s access to Kadena Air Base on Okinawa following North Korea's seizure of the USS Pueblo in January 1968.

[11] Sortie rates dropped to 1,600 per month in July 1969, 1,400 in October, and 1,000 in August 1970 before ramping back up in response to the 1972 Easter Offensive and the Linebacker raids. At the 800 sortie rate, voracious bomb consumption became a logistical and fiscal concern. Secretary McNamara was concerned with the annual half-billion dollar munitions bill generated by Arc Light to supply 800 sorties per month. Pralle, *ARC Light Jun. 1967-Dec. 1968*, xiii-xiv; Lake and Styling, *B-52 Stratofortress Units in Combat 1955-73*, 35-36, 49, 51; Schlight, *The War in South Vietnam*, 153; Van Staaveren, *Gradual Failure*, 179; Lt Gen Alvan C. II Gillem, interview by Dr. Robert R. Kritt, August 22, 1969, 174, Air Force Historical Research Agency, Maxwell AFB, AL.

[12] Some crewmembers also used BUF, a shorter version presumably referring to "Big Ugly Fucker."

model, the B-52D, to fulfill SAC's conventional commitment. Because SAC required formal training to switch between B-52 models, the B-52D crews shouldered the heaviest workload during Arc Light. Designed with the nuclear mission in mind, all B-52s had a limited conventional capacity to carry twenty-seven bombs inside their bomb bays. Anticipating a conventional bombing role in the early 1960s, SAC modified its B-52Fs to carry up to fifty-one bombs by adding external bomb racks under the wings in 1964 and 1965.[13] As a result, SAC picked its B-52F squadrons to open the Arc Light campaign.

By the end of 1965, engineers began modifying the B-52D fleet with the "big belly modification" that made it the most powerful aircraft in the skies of Southeast Asia. The modification tripled the B-52D's internal capacity to forty-two 750 pound bombs or eighty-two 500 pound bombs. With another twenty-four bombs slung on racks under the wings, the B-52 could carry up to 108 bombs totaling thirty tons.[14] By comparison, fighters typically carried six to eight bombs. Crews were proud of the B-52D's unique capability and the immensity of its bomb load made a powerful impression on them. Pilot Robert Hudson remarked proudly "The fact that it carried 108 bombs was pretty impressive. If you've ever seen 108 bombs in one location, it's a real eye-opener."[15] This modification made the B-52D SAC's conventional workhorse, and fated the B-52D community to carry the bulk of the bomber community's load in the war. These

---

[13] In response to Kennedy's flexible response strategy, the Air Force modified twenty-eight B-52Fs in 1964 under a program named "South Bay" that doubled B-52F conventional bomb load. In 1965 project "Sun Bath" modified an additional twenty-six B-52Fs to carry enlarged conventional payloads. Knaack, *Post-World War II Bombers*, 2:265-270.

[14] With its enhanced conventional capability, SAC replaced Arc Light's F-model bombers with B-52Ds by April 1966. Ibid., 2:256.

[15] Col Robert M. Hudson, interview by Thomas C. Moncure, March 3, 2005, 11-12, Veterans History Project. Library of Congress.

decisions imposed substantial motivational challenges on a small overworked population within the SAC community, until B-52Gs joined the battle in mid-1972.[16]

Flying the B-52: "Like Driving an 18-Wheeler Truck Without Power Steering"

The men who flew Arc Light formed six-man crews of two pilots, two navigators, an electronic warfare officer (EWO), and an enlisted gunner. Each man's experience varied by his duty station, his training, and his in-flight responsibilities. Pilots found limited opportunities to demonstrate their piloting skills during Arc Light's countless hours spent at high altitude on autopilot, but expressed pride in doing the difficult job of orchestrating the crew's actions effectively and by the book. Aircraft commanders enjoyed the leadership of the bomber's crew, but their copilots were often frustrated by a lack of piloting and leadership opportunities, and bided their time until they could become aircraft commanders. The two navigators operated in a dark, oppressive space in the belly of the bomber, but appreciated that their unique expertise in navigation, radar, and bombing was essential to the completion of the crew's mission. The bomber's electronic warfare officer and tail gunner were underutilized and largely underappreciated early in Arc Light because B-52s operated predominantly in the benign skies over South Vietnam.[17] All six crew-members had to come together as a crew in order to succeed, and their crew interactions helped define the overall aircrew experience over Southeast Asia.

---

[16] Lt Gen Alvan Gillem, the SAC director of operations, recounted General Ryan's (the SAC commander) decision to use the B-52Ds. The B-52D and G were the most numerous, but the D was chosen for Southeast Asia because it was the oldest: "'Well, let's don't send the Hs. That's the best we have got, and we might have to fight with that,' and we are going to for the rest of our lives. 'Don't send the Gs. They are not as new as the Hs, but they are the next. It will be the bulk of the SAC force,' and they are today. 'Let's use the Ds and the Es.'" Gillem, interview, 132.

[17] Appreciation for B-52 EWOs and gunners changed dramatically as B-52s flew near and over North Vietnam's potent air defenses, particularly during the war's final air offensive, Linebacker II, which featured B-52 strikes around Hanoi and Haiphong.

The pilots occupied two positions side-by side on the bomber's flight deck. They had wraparound windows that afforded good forward visibility but were limited in looking downward and towards the rear of the aircraft. Visibility was so limited to the rear that crews were unable to see whether all the bombs had released from the under-wing bomb-racks, which led B-52 wing commander Richard Hoban to raid the base clinic for dental mirrors to allow crews to see the wing-racks to check for remaining bombs.[18] Eight throttles dominated the console between the pilots. The pilots had to handle frequent fires, overheats, and in-flight shutdowns of the B-52D's temperamental J-57 engines.[19] Mechanical problems affected most B-52D missions, so the crews became troubleshooting experts.

Many pilots did not view the B-52 as a favorable assignment from pilot training. Although their instructors warned them that bomber missions were boring and the keenest competition was for fighter slots, most pilots assigned to fly the aircraft expressed some affinity for it and its unique mission. Like fighter pilots and transport pilots, bomber pilots became partisans for their aircraft because their reputation and identity were tied to the aircraft. Part of the affinity arose from pride in what it took to fly the bomber, captured in the saying: "you have to be tough to fly the heavies." Pilots believed it a positive reflection on their flying skills to fly a difficult aircraft like the B-52D well, similar to P.K. Robinson's attitude towards the F-100's flaws, which he saw as a positive (as noted in Chapter Two). Due to the efforts required to muscle the aircraft through the sky, one pilot likened flying the B-52D to driving "an 18-wheeler truck without power steering, airbrakes, or automatic transmission in downtown Washington D.C.

---

[18] Lt Gen Richard M. Hoban, interview by Capt Mark C. Cleary, October 14, 1983, 127, Air Force Historical Research Agency, Maxwell AFB, AL.

[19] Although eight operating engines were required for takeoff, the crew could continue the mission on seven engines if one failed inflight. The crew had to return to base if two engines needed to be shutdown. Because the engines were mounted in pairs, a severe mechanical failure in one engine could result in the loss of a second engine if pilots did not take action quickly.

during the rush hour," in other words, flying the aircraft was a very difficult task that reflected favorably on one's piloting skills if done well.[20] Pilot Robert Hudson looked back fondly on his years piloting the B-52. "A true pilot loves every airplane he ever flew." Although Hudson flew several other aircraft, "the B-52 carries a fond spot in my heart. The D model, being the older one, was probably the most fun to fly because I flew it in combat and it was very complicated. In every flight there were little emergencies that you had to take care of, but the airplane got you home."[21] Hudson's comment reflects personal pride in mastering a complex aircraft and using his skills, knowledge and ingenuity to solve the problems posed by it. To precisely control a difficult airplane demonstrated one's flying proficiency and validated one's skills (a concern for any aviator), but this demonstration could be especially important to a pilot not considered by peers to be on the higher levels of the hierarchy at pilot training.

Bomber pilots found takeoff, landing and air refueling the most challenging and satisfying phases of the mission because they showcased their unique piloting skills. Takeoff in a 450,000 pound combat-loaded B-52D was a thrilling and dangerous operation. Robert Hudson assessed that "every take-off was a challenge" in a combat-loaded B-52D, because the aircraft was so heavy and thrust-limited "it took a lot of runway"—nearly two miles—to reach takeoff speed.[22] As the pilots advanced the eight throttles to full power, they activated a water injection system that sprayed water into each engine to increase the density of the air and increase thrust. Clouds of dark smoke billowed from the black-painted B-52Ds adding to a spectacle that

---

[20] Lake and Styling, *B-52 Stratofortress Units in Combat 1955-73*, 49.

[21] Hudson, interview, 11-12.

[22] Ibid.

attracted numerous onlookers, "rain or shine."[23] As the aircraft accelerated along the runway, the copilot and navigator closely monitored aircraft acceleration up to refusal speed, (called "S-1") after which the bomber was committed to takeoff because there was insufficient runway remaining to stop. After S-1, the bomber was in a precarious situation because it could not stop, but until it reached takeoff speed (S-2), it lacked the minimum flying speed needed to lift off.[24] Takeoffs at Guam were tense because the runway had a pronounced dip in the center, so the aircraft accelerated well initially, but after the mid-point ran uphill and seemed reluctant to fly, in the words of one B-52D pilot it "scratch[ed] gravel at the end of the runway."[25] The heavy B-52D could take minutes to build up sufficient speed and altitude to attain a safe altitude. Takeoffs placed the navigators in a precarious position; because their stations were in the belly of the aircraft, their ejection seats fired downward and they needed a 500 to 700 foot altitude before they could eject safely. Pilot Nick Maier believed that the aircraft commander was "morally duty bound to stay with his stricken B-52 to at least 500 feet above the ground, for the navigators to survive."[26] John Mize recounted a takeoff from Guam where his water injection failed (with a loss of thrust) at the most critical phase of the takeoff—between S-1 and S-2. Unable to abort and too slow to takeoff, Mize staggered the aircraft into the air and could do little more than watch as

---

[23] Navigator Robert Harder asserted that "there was, and still is near unanimous agreement by aviators and groundlings alike that the maximum-weight Arc Light D-models, with eight screaming water-injected turbojet engines and billowing clouds of thick, dark smoke pouring out behind them, generated the most spectacular of all B-52 takeoffs" Harder, *Flying from the Black Hole*, 122.

[24] This was less a problem for fighters because most (F-4, F-105, and F-100) had a tail hook that enabled them to safely abort at high speed and catch an arresting cable erected at the departure end of the runway.

[25] Thatcher, interview, 19.

[26] The pilots had seats rated 0/120 which meant they could survive an ejection from zero height if the airspeed was at least 120 knots. The gunner in the B-52D released the aft section of his cabin and bailed out manually through the opening. Nick Maier, "Kadena - X-Wind Launch," in *We Were Crewdogs V*, ed. Tommy Towery (Memphis, TN: Tommy Towery, 2009), 167.

it dropped below the edge of the cliff that made up Guam's northern shoreline. Mize managed to level the bomber "at about 100 feet above the water, after a drop of 500 feet, [at which point] the aircraft gained enough speed to resume its ascent."[27]

The next and most significant test of pilot skills came about four hours into the mission when the bombers met KC-135 tankers north of Luzon for refueling. The navigator was responsible for getting the pilot to the rendezvous point on time, using celestial navigation and timing to get within radar range. Then with the help of radar, the navigation team directed the pilots until they could see the tanker, after which the pilots completed the join-up visually. Once behind the tanker, the pilot had to maneuver the bomber to a small envelope a few feet below and behind the tanker. Once stabilized in the envelope, an enlisted boom operator flying in the belly of the tanker extended and maneuvered a rigid refueling boom into the fuel receptacle over and behind the bomber cockpit. Due to the immense size, weight, and inertia of the bomber, anticipation was essential to maintaining a steady refueling position. Pilots had to make flight control and throttle inputs and then remove them before they had an effect on the aircraft to avoid over-controlling. Although techniques and proficiency varied, some pilots banged the controls from stop to stop with little visible impact on the aircraft position, while more skilled pilots developed an ability to make small and precise changes to hold a steady position for the twenty minutes needed to transfer a full forty- to fifty-ton load of fuel.

Skillful air refueling was an opportunity to demonstrate one's pilot proficiency, or to reveal one's limitations. Pilots believed their pride was on the line during refueling. James Hooppaw, a three-tour Arc Light veteran aircraft commander, observed that although there was little time for error on the refueling tracks, "pilot pride…kept them on the boom sometimes when

---

[27] John Mize, "Lessons Learned - Never Forgotten," in *We Were Crewdogs - The Vietnam Collection*, ed. Tommy Towery (Memphis, TN: Tommy Towery, 2008), 222-223.

skill seemed to have departed. If you were in the envelope you were expected to receive fuel." The ultimate disgrace was a breakaway—an urgent maneuver called over the refueling frequency designed to create immediate distance between tanker and receiver if refueling seemed unsafe. Hooppaw recounted that "the one thing a pilot dreaded was a breakaway, not only for the time consumed but for the supposed embarrassment of having everyone in the cell [three bomber crews and three tanker crews] know you had called it."[28]

Landings provided the third opportunity to display pilot proficiency, because the pilot at the controls had to skillfully manipulate the giant aircraft's speed, position, and height to achieve a smooth touchdown. Hard touchdowns or bounced landings were a source of embarrassment. Landings took skill, and unlike C-130, FACs, or fighter pilots, bomber pilots performed far fewer landings due to their long sortie lengths.[29] Pilot George Golding recalled evaluating landings from "Charlie Tower" (a glass-enclosed operations center overlooking the airfield) for entertainment, and using a humorous and unofficial code system to poke fun at their peers making poor landings. Bounced landings could be awarded a "Falcon Code 124" which meant: "take that runway, and that, and that."[30] But landings had a more serious aspect: in cases where bomb racks

---

[28] James Hooppaw, *Where the Buf Fellows Roamed* (Gig Harbor, WA: Red Apple Publishing, 1999), 126.

[29] A C-130 pilot might make five to ten landings a day, while bomber pilots made one landing every two or three days at the end of a long sortie.

[30] Falcon codes were irreverent commentaries on experiences and "edged [their] way into everyday conversations of TDY crews in Guam and Thailand." Several examples:

> 101 You've got to be shitting me
> 104 What the fuck, over?
> 105 It's so fucking bad, I can't believe it
> 272 One good deal after another
> 274 I'd rather have a sister in a whore house than a brother in a B-52!
> 269 Pardon me, sir, but I believe you have me mistaken for someone who gives a shit!

Ed Rasimus, "Friendly Fire Notebook - Page 3 - AviationBanter," accessed November 21, 2009, http://www.aviationbanter.com/showthread.php?t=8677&page=3; Tommy Towery, "Fading Memories, Odds and Ends, And Bar Stories," in *We Were Crewdogs - The Vietnam Collection*, ed. Tommy Towery

did not release the entire bomber's payload, a hard touchdown could jar un-dropped bombs loose, with dire consequences for the bomber and crew. Derek Detjen recalled a landing where a "bomb broke loose, [and] fell through the bomb bay doors" onto the runway and caused the aircraft to jump up roughly as it ran over the bomb, which then rolled down the runway behind the aircraft. In other cases, loose bombs could slide forward inside the bomb bay when the brakes or drag chute were applied on landing. Detjen recalled an occasion when a bomb "tobogganed forward, made a hole in the bulkhead at the front end of the bomb bay and ended up lodged in the alternator deck, behind the navigator and bombardier!"[31] Landings were the aircraft commander's prerogative, and copilots yearned to perform landings to validate their flying skills.

Copilot duties included management of the bomber's fuel and assisting the aircraft commander with the radios, checklists and emergencies. George Thatcher, who had built balsa models of fighters as a boy during the Second World War, recalled "my job as a copilot was to read those gauges and plot out our endurance." The B-52s numerous fuel cells and complex plumbing mandated active management by the copilot to keep the aircraft in balance. These duties often afforded copilots few opportunities to perform basic flying skills. Takeoff, refueling, and landing happened only once per sortie and occupied only about a half hour total in a twelve hour mission. The rest of the mission was accomplished on autopilot. Copilot William Burke voiced frustration over his copilot duties and lack of takeoff and landing opportunities during Arc Light to a SAC historian: "being a pilot … I don't feel that I consider myself just a book worm or a flight engineer on board the aircraft." Frustrated by the lack of opportunities to exercise his

---

(Memphis, TN: Tommy Towery, 2008), 122; George Golding, "Charlie Tower," in *We Were Crewdogs - The Vietnam Collection*, ed. Tommy Towery (Memphis, TN: Tommy Towery, 2008), 235-237.

[31] Derek H. Detjen, "Bombs Away--Well Almost!," in *We Were Crewdogs - The Vietnam Collection*, ed. Tommy Towery (Memphis, TN: Tommy Towery, 2008), 32-33.

unique pilot skills, Burke noted that in four and a half months of Arc Light flying, "I had gotten the dubious honor of getting to land an airplane once or twice and no takeoffs to my credit." Burke then joined a crew with a more generous aircraft commander who gave him "all of the takeoffs and landings and [I am] beginning to feel like I might be called a pilot again."[32]

The premium on precise, steady straight-and-level flying placed on flying the B-52 was oppressive to some pilots who were unable to exercise the freedoms of flight that they had enjoyed in pilot training and other commands. Although George Thatcher eagerly volunteered to fly the B-52 in 1961 to benefit his career, he tired of the routine nature of B-52 flying and by 1969, "I was so tired of flying the B-52 I would have done anything" to fly another aircraft. He transferred to the obsolescent and underpowered EB-66 and reveled in the relative freedom: "[I] thought I'd died and gone to heaven." He enjoyed the single-pilot EB-66 because he "didn't have a co-pilot to worry about" and "because once you got it off the ground it flew like a fighter. It really was good. You could roll, loop, immelmann, do anything with it."[33] Thatcher's joy indicates a yearning for a return to the piloting joys he experienced before he came to SAC. Thatcher wanted to control an aircraft, and once in the EB-66, he got to exercise sole control over the aircraft (without a "co-pilot to worry about"); he wanted a greater degree of freedom afforded by a more maneuverable aircraft and less restrictive regulation, and his ability to fly aerobatic maneuvers returned a sense of freedom of flight absent at the controls of a B-52.[34]

---

[32] Maj Alfred W. Foss, Capt Nash, and Maj Langford, interview by Dr. Robert R. Kritt, August 16, 1968, 5, Air Force Historical Research Agency, Maxwell AFB, AL.

[33] Thatcher, interview, 23.

[34] Gen Robert Huyser, a B-52 wing commander during Arc Light, recalled the enjoyment his B-47 bomber crews derived from acrobatically flying their earlier-generation medium bombers in a maneuver that would have been impossible for a B-52 due to its size, weight and performance. "For a bomber, we did something completely revolutionary and new. We established a tactic called the LAST [low altitude strategic toss] maneuver where we really tossed the bomb, went up and did an Immelmann [a half-loop], and went away from the bomb before it exploded.…Of course, for a bomber to go up and do an Immelmann was really

Two navigators, one serving as bombardier, and the other serving as navigator occupied a small, cramped, and dimly-lit compartment below the main deck nicknamed the black hole. Their side-by-side ejection seats faced small work tables for maps, dividers, plotters and navigation logs. Above and around the work tables, racks of weapons panels, radar scopes and controls, circuit breakers, and flight instruments surrounded the bomber's navigation team. Encircled by heat-generating avionics and close to the heavy equipment buried inside the bomber, the compartment was filled by the sound of "humming black boxes, whining gyros, the whistling slipstream, and screaming engines." Scents combined the smell of jet fuel, "overwarm wiring, greasy-metallic odors thrown off by black box electronic glow" and foul smells from the nearby urinal and "honey bucket." The atmosphere was dark because the black hole lacked a view of the outside world, insulating the navigators from the destructive work they were called on to perform.[35]

In this dark and forbidding environment, the bombardier (normally called the radar-navigator, radar-nav, RN, or just "radar") tuned, tilted, and steered the B-52's radar, and interpreted a smoky ten-inch screen that contained the bright spots of cultural features, shadows from high terrain, and the sharp contrasts between land and water to update the navigation position and to aim the bombs.[36] This ability to interpret the radar display came from months of practice: "After many weeks of nearly despairing he was ever going to able to catch on, the light bulb…would finally come on and the white electronic mush displayed on his radar screen

---

new and exciting. *We loved it; the pilots loved it. It was a lot of fun*, but a completely new period of SAC bombing." [author's emphasis] Gen Robert E. Huyser, interview by Col George P. Cole and Lt Col Maurice Marynow, March 29, 1985, 67, Air Force Historical Research Agency, Maxwell AFB, AL.

[35] Harder, *Flying from the Black Hole*, 130.

[36] The most frequent reference is radar-nav, used in the remainder of this study.

magically transformed itself into buildings, towns, dams…."[37] The B-52D radar navigator had a limited view of the outside world through an outmoded optical bombsight that was disabled for bombing, but was used as a downward looking periscope to look under the aircraft for threats, and to observe the bombing results and note secondary explosions.

The more junior navigator, seated to the right of the radar navigator monitored the aircraft's position, calculated direction and speeds needed to keep the bomber on course and on time, and relayed those corrections to the pilots up above. Navigator Robert Harder assessed the navigator was "arguably the hardest working man on the airplane," because he had to prepare charts, the mission log, headings, times and distances. "It invariably took at least one solid workday to do this, while meanwhile the other five guys were out drinking beer around the pool—a condition of employment no Buf navigator ever really stopped resenting." In-flight, this workload could be a blessing on long Arc Light missions from Guam when crews found it a challenge to fight off boredom during the long transits across the western Pacific.[38] For two and a half hours of the three and a half hour transit between Guam and the Philippines, the B-52 was beyond contact with the land, and the navigator relied on sextant, compass and watch to stay on track.[39] North of the Philippines, the B-52 formations rendezvoused at a designated point at a specified time, position, heading, and altitude over the Pacific Ocean, with similar KC-135

---

[37] Harder, *Flying from the Black Hole*, 76.

[38] The navigator's planning duties were minimized by standardized Arc Light routes and missions, but even during Arc Light, Harder points out in pre-mission photo the nav team "working diligently while the others are jaw-boning or taking a nap." Ibid., 92, 112.

[39] Escarpa Point, a promontory on the northeast side of Luzon was a prominent feature used to update the bomber's position after the long over water leg. The navigator advised the radar navigator when the bomber was 200 miles out (about three hours into the mission) so the radar could be switched out of air-to-air formation mode to its maximum ground-mapping range for a navigational update. The radar navigator used a radar-tracking handle to put a set of crosshairs over the tip of Escarpa Point on his radar display. The navigator was then able to use the latitude and longitude information displayed in a pair of position counters to update the bomber's navigation systems. Ibid., 132.

formations coming from Okinawa. Such precision flying, done routinely, was no small achievement, considering tankers and bombers made long transits over open ocean. Wing commander Alvin Fortney saw this as a source of pride and validation. "The interesting part about the mission of course is to see the SAC training really payoff. And by that I mean, realizing that here is a B-52 or flight of B-52's that takes off from Guam and several hours later, another flight of KC-135s takeoff from an entirely different base thousands of miles away and at the precise moment that they have planned they rendezvous and conduct the refueling, never saying a word, complete their refueling and go on about their business."[40]

The electronic warfare officer (EW) was responsible for defense of the bomber and was stationed behind the pilots and above the black hole. Like the navigators in the black hole, EWs had a synthetic and limited view outside the bomber. Vince Osborn wrote "in my crew compartment as an electronic warfare officer on the B-52, I was surrounded by racks of electronic equipment and didn't even have a window to the outside world."[41] Electronic warfare officers had a reputation for being brainy and eccentric practitioners of a little-understood and highly-classified dark science. Electronic warfare officer Tommy Towery reminisced that "I entered into a black hole where nothing I learned or did could ever be understood by my mother or by most of the people who knew me."[42] Through his electronic displays the electronic warfare officer monitored incoming signals, analyzed them to determine if they constituted a threat to the bomber, used electronic jamming and chaff bundles to confound hostile radar operators, and flares to decoy heat-seeking missiles launched by enemy fighters.

---

[40] Col Alvin R. Fortney, interview by Lt John D. Considine, August 23, 1968, 7, Air Force Historical Research Agency, Maxwell AFB, AL.

[41] Osborne, "Linebacker II--A Personal View," 167.

[42] Tommy Towery, "My Mother Never Understood," in *We Were Crewdogs V*, ed. Tommy Towery (Memphis, TN: Tommy Towery, 2009), 88-93.

Until the April 1972 Easter Offensive, there were no radar-directed systems in South Vietnam that threatened the B-52s. Missions into North Vietnam, Laos, and the northernmost parts of South Vietnam occasionally came under fire from SA-2s based in North Vietnam, but the majority of Arc Light missions were considered "milk runs" which minimized the importance of the electronic warfare officer in the eyes of the crew. As a result, electronic warfare officers resigned themselves to minor secondary tasks. On the ground, the electronic warfare officer accounted for all the crew's classified materials.[43] Over water, he took celestial observations through a sextant port in the roof of bomber to help the navigator determine the aircraft's position over the ocean. He also ran a tape recorder plugged into the intercom system to record audio from threat radars and made a post-strike report on the long-range high frequency (HF) radio.[44] SAC quickly saw the value of this recording equipment and mandated its use during critical phases of flight in order to evaluate crew performance, while the crews valued it because the electronic warfare officers would play music tapes during non-critical phases of flight.[45] It was not until B-52s flew north into heavily defended airspace in 1972 that electronic warfare officers gained the respect of their crewmates: Harold Hughes noted in his log during operation Linebacker "The crew treated me totally differently after the mission briefing that night. All of a sudden I wasn't the secretary anymore, but the guy who could make 55 square meters of aluminum," (which was the radar cross-section of their B-52) "disappear" from enemy radar scopes, "thereby saving our

---

[43] Vince Osborne, "The Door Rester," in *We Were Crewdogs - The Vietnam Collection*, ed. Tommy Towery (Memphis, TN: Tommy Towery, 2008), 94.

[44] EWs resigned themselves to meager contributions (unworthy of their highly specialized electronic warfare training) during missions over South Vietnam. George Jackson dutifully reported in his contribution to the B-52 anthology that "my main duty as the EW was to keep the recorder going and to give the HF post-strike report." George Donald Jackson, "The EW Bomb Run," in *We Were Crewdogs - The Vietnam Collection*, ed. Tommy Towery (Memphis, TN: Tommy Towery, 2008), 34-37.

[45] Hooppaw, *Where the Buf Fellows Roamed*, 303.

collective butts. I was now an integral part of the team."[46] Like the other positions on the B-52 crew, electronic warfare officers relished opportunities to apply their unique skills to complete the mission.

B-52D gunners had windows, but were isolated in the tail, 150 feet behind the rest of the crew. Gunners stayed connected to the rest of the crew through an intercom. They could reach the main crew cabin only through a long, fearful, and torturous crawl through the "unreal" noises, "very sharp protrusions and very hot surfaces" of the bomb bay.[47] Within their cramped station in the tail, gunners were at the end of a long moment arm that originated from the middle of the aircraft to the tail, which could produce a turbulent ride.[48] Electronic warfare officer Gary Henley's retrospective on his gunners recalled several who needed new helmets when theirs cracked due to impacts suffered in turbulent air: "those gunners had to literally hold onto the handles around them for their dear lives or have their head or helmet bounced around like a pachinko ball."[49] Gunners, referred to as "guns," took pride in spotting other aircraft and advising the crew of other airborne traffic. Although Arc Light featured no encounters with enemy aircraft until December 1972 (requiring the defensive fire by the gunner), gunners were integral to running aircraft checklists, visually monitoring the aircraft condition, and providing the pilots and navigators a backup means to maintain formation on bombing runs. Crews normally maintained formation position through the aircraft's radar system. When the main radar

---

[46] Arthur Craig Mizner, "Maneuver! Maneuver! Three SAMs - Six O'clock - Closing Fast!," in *We Were Crewdogs - The Vietnam Collection*, ed. Tommy Towery (Memphis, TN: Tommy Towery, 2008), 211.

[47] Jack Cotrel, "The Longest Crawl," in *We Were Crewdogs V*, ed. Tommy Towery (Memphis, TN: Tommy Towery, 2009), 196-199.

[48] B-52G gunners flew in the crew compartment with the rest of crew controlling their guns strictly by radar, but the G-model did not join the campaign until Nixon's 1972 airpower surge named "Bullet Shot."

[49] Gary Henley, "My B-52D Gunner," in *We Were Crewdogs V*, ed. Tommy Towery (Memphis, TN: Tommy Towery, 2009), 73.

malfunctioned, gunners filled in by measuring the distance between aircraft with their gun-laying radar. This function, called a "bonus deal," allowed trailing aircraft to determine their exact formation position in order to time their bomb release accurately. Like the C-130 loadmasters and flight engineers, gunners were enlisted members of a predominantly officer crew, and their relationship was very similar to that between the officer and enlisted members of tactical airlift crews. Gunner Rusty Keller believed that although "there is social standing that is both written and unwritten that separates" officer from enlisted crewmembers, "you were forced by circumstances to exist on a much closer level. The enlisted man flies with [the officers], eats with them, travels with them, occasionally sleeps with them, goes hunting and fishing with them, parties with them, and some even died with them. The officers on his crew became his closest friends." But acknowledging the officer-enlisted gap, Keller "always gave my officers good, proper military respect, by calling them by rank, or rank and last name when in uniform." But "in the airplane, we always addressed each other by crew position. Out of uniform I could loosen up a bit."[50] Although each of the six crewmembers experienced Arc Light differently due to the differences in their crew position, training and in-flight duties, their performance ultimately hinged on how they interacted together as a team.

The men from these six crew positions trained, deployed, lived, and fought together as an integral unit underscoring SAC's centralized management philosophy, and illuminating SAC motivational methods. Andrew Anderson, the commander on Guam in 1972, thought keeping crews together was important for Arc Light deployments. "During a combat mission, you always

---

[50] Fighter pilots had a more distant relationship with enlisted airmen because fighter crews all officers. Enlisted airmen preformed technical functions within fighter wings, sustaining the wing's aircraft and performing many support and administrative duties. As a result, fighter crews could maintain greater officer-enlisted distance, although many felt close to their crew chiefs because of their mutual link in the aircraft that they either fixed or flew. Rusty Keller, "My Path to Becoming a B-52 Gunner," in *We Were Crewdogs V*, ed. Tommy Towery (Memphis, TN: Tommy Towery, 2009), 7.

want to keep the crew together, and to the degree that the wing commanders could, they did."[51] SAC pursued crew integrity to the point that upon return to their home base, wing schedulers granted these crews leave over the same weeks in order to maximize crew integrity.[52] Wing commanders rated their crews within a strict proficiency-based hierarchy established by SAC. Wings designated crews with a letter and number ("E-4", for example). Letter designations were NR, R, E, and S and indicated the crew's proficiency. "NR" crews were non-combat ready, newly formed and undergoing training. "R," or ready crews were fully trained and certified to perform the mission without additional training or oversight. "E," or elite crews were highly proficient, and "S," or select crews were most proficient, and normally performed instructor and evaluation functions.[53]

SAC's crew designations illuminate its incentive structure. Under Gen Curtis LeMay, top-performing crews were eligible for "spot promotions" that advanced SAC officers ahead of the Air Force's normal promotion board system. Conversely, under-performance resulted in revocation of a spot promotion. B-52 pilot Chris Adams enjoyed a spot promotion to captain, and observed that this "induced more pressure on the individual and crew than was recognized—one 'screwup' by any crew member usually meant all 'went back to the real world,'" losing their spot promotions and reverting back to their permanent ranks.[54] B-52 pilot George Thatcher was

---

[51] Lt Gen Andrew B Anderson, interview by Hugh N. Ahmann, November 3, 1986, 137, Air Force Historical Research Agency, Maxwell AFB, AL.

[52] The creation of "integral" crews was an early initiative by General Curtis LeMay to improve SAC efficiency. Chris Adams, *Inside the Cold War: A Cold Warrior's Reflections* (Maxwell Air Force Base, AL: Air University Press, 1999), 95.

[53] Before Vietnam, the second highest tier was "L" for Lead, signifying the crew was qualified to lead missions. By Vietnam, the status was changed to "E," which signified Elite, Experienced, or Excellent, dependent on local usage. Adams, *Inside the Cold War*, 96; Harder, *Flying from the Black Hole*, 91.

[54] General Curtis LeMay won the ability to award spot promotions a year after he took over SAC in 1948. The system was eliminated a year after LeMay retired in 1965. Adams, *Inside the Cold War*, 97.

attracted to SAC in 1961 because of this incentive: "I chose bombers because I thought I could get promoted faster" even though he thought flying a fighter might be more enjoyable, "I was thinking career, not thinking fun." If "you were on a select crew in SAC, for the first couple of years I flew anyway, you could get a spot promotion."[55]

SAC's in-flight evaluators served on select crews and served as a "standardization and evaluation board," or more commonly "standboard." Standboard aviators were expected to uphold SAC in-flight discipline and had the reputation for being the most knowledgeable crews, but also the most uncompromising towards discrepancies, which gave them a "black hat" reputation. Standboard applied the strictest interpretation of the rules and represented central authority by serving as the commander's eyes and ears and filing reports on crews guilty of minor infractions. Dean Hunter (the FAC who was ridiculed when he tried to brief Robinson Risner's F-105 pilots on the situation in Southeast Asia prior to Rolling Thunder) recalled an incident where a SAC standboard lieutenant colonel had caught him violating SAC regulations by scrutinizing Hunter's B-47 bomber through binoculars from the control tower. The lieutenant colonel reported Hunter for recycling a malfunctioning landing gear even though "I felt I was probably far enough away from the base and so-and-so couldn't see me."[56]

There was also a strict hierarchy within each crew based first on aeronautical rating and then on in-flight duties. Pilots ruled SAC and they ruled within a bomber's crew. Navigators

---

[55] Foss, Nash, and Langford, interview.

[56] Hunter recycled his B-47's landing gear to fully retract it. Recycling landing gear was contrary to SAC regulations and the stanboard member filed a Hazardous Flight Report on Hunter. Lt Col Dale Shaw, Col Clement E. Bellion, and Lt Col Leon M. Shaddox, eds., *The Legacy of Daedalus: War Stories and Flying Tales* (Paducah, KY: Turner Publishing Co, 2000), 152.

came second, followed by electronic warfare officers, and then the enlisted gunners.[57] The aircraft commander received the greatest deference and was responsible for leading the crew, the safety of the aircraft, and the accomplishment of the mission. The copilot came next in precedence, because he wore pilot wings, backed up the pilot and, if proven capable, would eventually upgrade to aircraft commander. Although many of the attractions of flight enjoyed by pilots of other aircraft types (such as freedom, autonomy, and the joys of operating a fast, maneuverable aircraft) were limited by the regimented SAC flight regime and the cumbersome, non-maneuverable B-52, young B-52 pilots aspired to become aircraft commanders and lead their own crew. Their path was to demonstrate proficiency by precisely adhering to SAC standardization and operating "by the book."

Status then flowed behind and one deck below the pilots, to the radar navigator and then the navigator. Because the radar navigator provided aiming for the bombs and had the greatest role in achieving an accurate weapons delivery, he was normally the more experienced of the two officers in the black hole.[58] The radar navigator helped the more junior navigator. Both men sought to apply their unique skills in the completion of the bomber crew's mission. Like the C-130 navigators, the bomber navigators were technical experts and enjoyed playing important and necessary roles in enabling mission success. Unlike C-130 navigators, however, the B-52 could not complete its mission without their contributions. Although these men were indispensable to the operation of the massively complex aircraft, their careers were capped, as pilots normally advanced to higher command. As a brand-new lieutenant in 1968, B-52 navigator Robert Harder

---

[57] This hierarchy was so ingrained that nearly all crew members recall the other members of their crew in this same order: "AC, CP, RN, N, G." SAC historians asked their questions of B-52 crews in the same order. Foss, Nash, and Langford, interview.

[58] In cases where the copilot was inexperienced or very junior, the radar navigator might be held in higher regard within the crew due to his experience and critical role in the B-52 mission.

was accosted by legendary Col Thomas Ferebee, bombardier of the *Enola Gay* in the officer's club bar. After a few drinks, Ferebee sketched a dreary career path: "after three or four years as a nav, you'll upgrade to radar nav, a job you will keep for ten years, probably longer. If you're clever or lucky, you might someday wangle a way to unstrap the beast from your ass and finish with a job in the command post, wing bomb/nav shop" or wing staff "for sure…you can forget about wearing one of these" colonel's eagle insignias since navigators in SAC were unlikely to get promoted past lieutenant colonel. Harder ultimately elected to not pursue the Air Force as a career and left the military as a captain. [59] B-52 pilot Nick Maier describes in his novel *B*U*F*F* that "as a team, [the navigators] spent the majority of their waking hours bitching and degrading pilots. Their invective was inspired by the cruelty of fate, which had denied them the glamour and glory of piloting in their humble lives. It was decreed that they sit submissively behind and below their masters and not have a seat by the window."[60]

Like the radar navigator and nav, electronic warfare officers were also specialists. Because most Arc Light flying took place in benign airspace, the electronic warfare officer's status rose only when nearing North Vietnam's air defenses and the crew's survival became more dependent on his abilities. Electronic warfare officers were also rated navigators and faced the same career limitations as the "black holers." Tail gunners were at the bottom of the scale because they were the only enlisted member of the crew. Although some crews took advantage of the rank gap and unduly worked their gunners, others went out of their way to equitably distribute the workload in a demonstration of respect. B-52 pilot James Hooppaw's crew made it a point to

---

[59] As bombardier on the Enola Gay, Ferebee dropped the atomic bomb on Hiroshima. Robert O. Harder, "My Encounter With Immortality," in *We Were Crewdogs V*, ed. Tommy Towery (Memphis, TN: Tommy Towery, 2009), 81.

[60] Lothar Nick Maier, *B*U*F*F* (Bloomington, IN: Trafford Publishing, 2002), 131.

help their newly-assigned gunner with menial tasks loading the aircraft and "from that point on, he was ours."[61] On base, there was a rigid officer-enlisted divide, but crews often found ways to socialize as a crew off base, especially at Kadena and U-Tapao, which enjoyed a slightly looser environment than Guam.[62]

The need to synchronize the efforts of six different crew positions mandated rigid in-flight discipline and crew coordination. Many B-52 functions were complex and labor intensive, embodied in the crew's in-flight checklists. During critical phases of flight—takeoff, landing, and on the bomb run—there was no time for extraneous banter as the crewmembers accomplished the required checklist steps needed to complete the task at hand. Although F-105 pilots had seventeen distinct steps needed to release a bomb, single-seat pilots normally memorized their checklists and could very quickly configure the aircraft to drop from memory. Bomber crews painstakingly read, performed, and verbally verified the completion of each checklist step to eliminate defects and to synchronize the independent actions of the airplane's six aviators. On the bomb-run, the navigator primarily helped the radar-navigator, but was also responsible for monitoring the overall pacing of the bomb run checklists to ensure required tasks were accomplished in time.

SAC commanders and standboard were sticklers for concise, standardized communications, and rigid checklist adherence. Unlike TAC fighter pilots who had a flexible approach to tactics, SAC published a regulation 55-2 that covered the aircraft's tactical employment and expected crews to adhere to the letter of the law. Any deviation from standards could lead to negative repercussions. One innovative electronic warfare officer worked around a

---

[61] Hooppaw, *Where the Buf Fellows Roamed*, 298.

[62] Hooppaw recounted holding crew dinners (that included the gunner) downtown in Thailand, and on Okinawa, at the officer's club on the nearby Marine base. He held none with their gunner at the Air Force Base officer's club, unwilling to break the Air Force's social norms so blatantly. Ibid., 140.

double radio failure by tuning his electronic warfare gear to hear ground radar instructions, and relayed them to the pilots through the completion of a successful bomb run. The aircraft commander was pleased about completing the mission, but advised the crew to not disclose this non-standard innovation. "After we landed, the pilot gathered us together and again told us not to say anything about this at debriefing. 'WE MAY BE IN A LOT OF TROUBLE!'" The wing staff, however was more enlightened than the crew expected and praised them for "the best demonstration of crew coordination" they had ever seen. The wing staff's chief electronic warfare officer was also appreciative because this "proves the EWs were worth something other than running the recorder."[63]

The Arc Light Mission: "Bombs Away"

Ultimately, the Arc Light crews focused their efforts to put heavy bomb loads on target although their high-altitude bombing runs were distant and insulated from their destructive effects. Unlike fighter pilots, bomber pilots exercised very little agency in the actual bomb run and kept the bomber on course, while the navigators in the black hole aimed the bombs. Because most targets were indistinct swaths of jungle suspected of hiding insurgents and supplies, crews often doubted the effectiveness of their strikes. Crews craved feedback on the effects of their attacks, but Seventh Air Force intelligence could do little to provide them meaningful bomb damage assessments, so SAC turned inwards to validate their crew's exertions. Bomb accuracy, checklist adherence, crew coordination, and crew standardization became the institutional measures of merit for B-52 bomb runs, distancing crews from their violent purpose.

---

[63] Jackson, "The EW Bomb Run," 34-37.

In 1968, Col Winston Moore, the director of B-52 operations at U-Tapao Air Base identified three major categories of B-52 targets: interdiction against lines of communications, strikes to destroy bunkers and tunnels in insurgent base areas, and raids against enemy troop concentrations.[64] The target type, however, had no impact on the crew's procedures because they followed standardized bombing tactics to saturate one kilometer wide by two or three kilometer long target grids overlaid onto a target area (regardless of the type of target contained within). Formations of three bombers strove to stitch three parallel lines of 108 bombs down the long axis of the target box. Given a regular interval along a two kilometer bomb run, the B-52D's standard bomb load could put a 500 or 750 pound bomb every sixty feet.[65] Crews flew bomb runs in straight and level flight from very high, safe, and distant altitudes—normally between 30,000 and 35,000 feet. The radar navigator opened the bomb bay doors a few seconds before bomb release causing a slight aerodynamic rumbling. He made the age old "bombs away" call on the intercom as he triggered the bomb release through a pushbutton trigger which began the six to nine second bomb run. In the black hole and on the flight deck, a bomb release indicator counter (called the "BRIC") flashed quickly indicating bomb release. As the aircraft quickly purged its thirty ton payload, it rose and gave a lightening sensation in the seat of the pants. Flight surgeon Clint Chambers flew as an observer on several aircraft types in Southeast Asia and found the B-52's bomb-run unremarkable: "the only thing that you could tell with the B-52" that it was dropping

---

[64] Col Winston E. Moore, interview by SSgt James Smith, August 22, 1968, 2, Air Force Historical Research Agency, Maxwell AFB, AL.

[65] A two kilometer bombing pattern was 6,561 feet long. Ideally 108 bombs, evenly distributed would impact 60.8 feet apart (or ninety feet for a three kilometer pattern). In practice, ballistics of the 500 and 750 pound bombs differed due to their weights and shapes, and some bombs did not release due to bomb rack malfunctions creating an uneven pattern. Laterally, the bombs from each aircraft made a long narrow pattern. The lead bomber sought to bomb down the center of the grid with following aircraft displaced right and left to widen the formation's pattern. Laterally, the bombing pattern was far less dense because it was essentially three bombs wide across a one kilometer-wide grid, or one bomb every 820 feet.

its payload is that "when the bomb is released the aircraft would go up sort of like an elevator and you would get that feeling." For Chambers, "that is the way you knew the bombs were gone."[66] With the bombs gone, crews turned towards home and continued on, seven or more miles above the destruction that they had wrought below.

Bomber pilots had a relatively minor role in the actual bomb run. Unlike fighter pilots, who had to synchronize speed, dive angle, position, and bomb-sight aiming simultaneously, B-52 pilots monitored crew performance, maintained straight and level flight, and followed steering instructions. Normally accomplished on autopilot, the pilots sought to provide a steady platform in straight and level flight until the bombs were all gone. They sought to precisely follow the radar-navigator's guidance by centering a steering needle on the instrument panel. If the pilots deviated from the steering, the bombs missed their target laterally. From the flight deck, the pilots could not see the target, which was hidden seven miles below the bomber's large, blunt nose, visually and psychologically distancing them from the destruction they were unleashing. The bomb-run was a period of heightened attention and concentration, but otherwise to the pilots, not very unlike the rest of the eleven hour Arc Light mission. Bombing runs became so matter of fact, they receive relatively scant memoir or oral history coverage; one pilot admitted to falling asleep during a bomb run. "I have a confession about going to sleep myself, in 1969 while watching my own bombs drop, no less."[67] Pilots in the second and third aircraft in a bomber formation had an additional task to maintain a precise formation position, normally one mile behind the preceding aircraft and displaced right or left a pre-planned distance. Early Arc Light missions featured close

---

[66] Clint Chambers, interview by Kim Sawyer and Stephen Maxner, February 19, 2001, 95, The Vietnam Archive, Texas Tech University.

[67] Peter Seberger, "Early Arc Light," in *We Were Crewdogs - The Vietnam Collection*, ed. Tommy Towery (Memphis, TN: Tommy Towery, 2008), 22-23.

visual formations (a few hundred feet apart) to get a tight bombing pattern until a midair collision claimed two bombers and six lives (including Maj Gen Crumm, the Air Division Commander on Guam) on July 7, 1967.[68] An investigation by SAC headquarters found the wing staff at Guam guilty of violating SAC regulations on formation flying, after which the bombers reverted to a more distant one-mile in-trail formation for the rest of the war.

The black hole was the true center of activity on a bomb run. The navigator sought to put the aircraft in position, on time to start the bomb run, and help the radar navigator pace himself. Navigator Gaylord Lipsack reported in 1968 that on a bomb run the radar navigator is "interested in getting a bomb on target, you see. So he's going to forget about the checklist at times. So this is my responsibility, to keep him going so that we can have everything ready to go prior to bombs away."[69] Manipulating the controls on his ten inch radar scope, the radar navigator applied all of his radar interpretation skills to identify the aiming point with the B-52's powerful ground mapping radar. In cases where the target was unlikely to show up on radar (which was the norm for South Vietnam since many targets were indistinct patches of jungle), the radar navigator plotted alternative radar aiming points offset a few miles from the target that had a better chance of showing up on radar. Early Arc Light missions found a scarcity of usable offset radar aiming points, so some missions employed a radar beacon emplaced near the drop grid that the radar navigator could locate with the B-52 radar. Emplacing a radar beacon by helicopter could reduce the chances of surprise and be hazardous in truly enemy-occupied areas, so SAC worked on an alternative. Starting in April 1966, the command deployed ground radar systems normally used to

---

[68] Crumm was one of two USAF Major Generals killed in combat in Vietnam. Maj Gen Robert F. Worley, the Seventh Air Force Vice Commander was killed in an RF-4 on 23 July 1968. Hobson, *Vietnam Air Losses*, 156.

[69] Foss, Nash, and Langford, interview, 10.

evaluate training bomb runs in the United States, and modified them to provide precise steering to bomb release points calculated from the ground. Named "Combat Skyspot," SAC deployed ground radar units to South Vietnam, Thailand, and a covert site in Laos to guide bomber and fighter drops throughout much of the Southeast Asian theater.[70]

By taking over the direction of the bomb-run, Combat Skyspot decreased the radar navigator's role and the necessity for his expert radar interpretation, but increased overall B-52 effectiveness. Although Skyspot increased accuracy, radar navigators did not favor ground-controlled drops because they diminished opportunities for them to employ their expertise in radar scope interpretation and radar aiming. Radar navigators grumbled about the lost opportunity to exercise their unique skills, similar to the fighter pilot grumblings when they fell under Skyspot's direction in Rolling Thunder. Radar navigator William Anderson preferred directing the bomber's attack through his own radar (called synchronous bombing) to turning responsibility over to the ground control: "I feel a great personal satisfaction in flying these synchronous missions because I'm the one that's making the release. I have control of the bomb run, and if we do well, it's to my credit. If we do wrong, it's my fault." Although early Arc Light deployments primarily used synchronous bombing (about 90 percent as estimated by one radar-nav), by 1968 ground radar stations controlled most of the missions to the radar navigator's frustration.[71] Even though Anderson believed that many radar aiming points available in South Vietnam were "rather wormy," he still preferred them to ground-controlled drops, grousing that over one stretch "we've

---

[70] Skyspot radars guided most aircraft reliably out to forty miles from the site. Beyond forty miles, aircraft equipped with radar beacons could be guided out to two hundred miles. B-52, F-100, and EB-66 aircraft were so equipped. Maj Richard A. Durkee, *Combat Skyspot*, CHECO Contemporary Historical Evaluation of Combat Operations, August 9, 1967, 6, Air Force Historical Research Agency, Maxwell AFB, AL.

[71] Skyspot directed 660 Arc Light bomb releases in 1966, 3,699 in 1967, and 16,465 in 1968. 16,465 drops of the 20,620 Arc Light missions flown in 1968 tallies up to 79 percent of that year's sorties. Pralle, *ARC Light Jun. 1967-Dec. 1968*, 52; Foss, Nash, and Langford, interview, 7.

been *stuck with* [Skyspot] missions…[for] about two and one-half weeks."[72] Despite this loss of personal agency, accuracy generally improved with Combat Skyspot. Average miss distances (called circular error average or CEA) were in the two to three hundred foot range for Skyspot drops, while five hundred foot errors were common in synchronous runs.[73] Ground radar-directed bombing further increased B-52 effectiveness because it allowed the bombers to adjust to urgent target requests in-flight. Synchronous releases required extensive preflight planning and radar predictions for the navigation team to precisely locate the target box.

A more flexible approach, called "Bugle Note," made provisions for B-52s to fly standardized routes into the theater, but then fall into one of several Skyspot-directed bombing tracks that enabled the bombers to easily shift in-flight to any target underneath the tracks. Bugle Note was an innovation that allowed SAC to maintain nominal control over their bombers, and granted greater flexibility to MACV's target planners.[74] MACV could identify targets, pass them to the SAC liaison in Saigon who relayed to Skyspot and re-direct aircraft already in-flight to a new target. Lt Gen Selmon Wells, the commander on Guam from 1967-1968, believed Bugle Note "gave MACV the flexibility that they wanted" but still allowed SAC to know where their aircraft were. "We didn't know what target we were going into until we dropped the bombs" but "we knew in what sector it was going to be…we really didn't have to know what that target was." Without the Bugle Note procedures, Lt Gen Wells was concerned that "you lose control of your

---

[72] Author's emphasis. Foss, Nash, and Langford, interview, 7-8.

[73] Durkee, *Combat Skyspot*, 14-19.

[74] Earlier attempts to make SAC bombers more responsive to target changes were unsatisfactory. SAC designated a quick reaction force on Guam to respond to urgent requests, but it was hobbled by hours of necessary planning, aircraft start, taxi, takeoff, and five to six hours of transit time. SAC found the quick reaction distasteful because "we had to tie up crews and airplanes" and it "really didn't do what they [MACV] wanted." Lt Gen Selmon W. Wells, interview by Dr. Robert R. Kritt, May 3, 1971, 11, Air Force Historical Research Agency, Maxwell AFB, AL.

force and two, it was dangerous because that air up there was pretty well saturated with airplanes." The first point is more significant, because the majority of air activity over South Vietnam took place far below the B-52 operating altitudes of 30,000 to 35,000 feet, because bomb-laden fighters, FACs and tactical airlifters could not reach SAC's typical operating altitudes. Wells continued with SAC's real motivation: "we wanted to know where our airplanes were and what their target was going to be and to maintain constant control of the machines….The only command really that was prepared to manage B-52s was SAC. SAC understands the big airplanes and the problems and the control that you must have. The arrangement the way it was, I think, was by far the best."[75] Bugle Note generated even greater distance between the crew and target because crews would not even know their target under Bugle Note's last-minute directions. Normal pre-planned strikes involved considerable study of target area maps by the navigator and radar-nav so that they could identify the target accurately. Under Bugle Note, crews launched from Guam without a target, and followed a steady stream of ground instructions to their bomb-release point.

As described in Truong Nhu Tang's narrative at the opening of this chapter, Arc Light strikes rained down destruction on a massive scale. Each bomber's thirty-ton payload rained down fire, concussive blasts, shrapnel, and deep craters upon anything in their path including enemy combatants, structures, animals, empty jungle, or innocent civilians. But the crews' physical and emotional distance from such destruction, the machinations of the targeting process, and the crews' genuine concern for accuracy overshadowed potential doubts over the morality of Arc Light's B-52 strikes.

---

[75] Ibid., 11-12.

Bomber crews were physically and psychologically distant from the destruction wrought by their Arc Light missions.[76] Physical and mechanical distance accrued from B-52 flight patterns and aircraft systems. Two of the bomber bases were 1,500 to 2,500 miles from South Vietnam, and the third was close to Bangkok. The B-52's seven mile-high bombing altitude ensured that the crew could not see the target area as they approached the bomb release point, and after the attack, only the radar navigator and gunner had a chance to observe the bomb impacts. The radar navigator watched for secondary explosions through his bomb sight periscope and the gunner observed the strike's tiny white cotton-ball puffs bloom across the target box from his vantage point in the tail, although they were not ensured a glimpse of the target because clouds often obscured the ground. The bomber's aiming systems created mechanical distance. A simple deviation indicator or compass heading shaped the pilots' perspective of the target since they lacked a sensor to view the target area. The nav team's five- and ten-inch radar scopes provided a synthetic representation of the ground, although bombing grids overlaid on featureless jungle provided little to observe in the radar, which was best suited to observe cultural features, sharp mountaintops, or land-water contrasts.

SAC seldom received reports on the effects of their bombing, and this lack of feedback did not lessen any of the emotional and physical distance inherent to Arc Light. One B-52 navigator noted in 1968 that "as far as the effectiveness of what we are doing, the navigator has really no idea whatsoever. He can't see out of the airplane, all he has is a small radar set in front of him, which does not give any indication at all of the effectiveness of our bombing raids. Therefore, the only thing that I can go on is intelligence reports that are presented to all of us."[77]

---

[76] Tommy Towery, E-mail message to author, August 8, 2010.

[77] Maj Alfred W. Foss, interview by Dr. Robert R. Kritt, August 16, 1968, 13, Air Force Historical Research Agency, Maxwell AFB, AL.

Bomber crews, however seldom received reports of post-attack bomb damage assessment (BDA). Col Carlton Koncz, assistant director of operations on Guam from 1965-1967 considered BDA one of "the most frustrating topics that we had in 3rd Air Division all the time I was there. As any commander, any staff anywhere in the world when you do an operation, you want to know how you did. You want to evaluate your results and, of course, try to better them."[78] MACV in Saigon struggled to determine the results of Arc Light strikes, but found assessment nearly impossible, given many of the remote strike locations in insurgent-held regions. FACs or ground teams provided occasional feedback. O-1 pilot Kenneth Johnson recalled getting right on the deck to assess a strike, which he likened to "a lawn mower. It cuts those trees down." But in the chaos of an Arc Light strike, even on the deck, there was little evidence of the enemy. To Johnson, the best evidence of enemy presence was rice scattered over the ground, indicating nothing more than a destroyed supply cache.[79] Some airmen were less enthusiastic about feedback they did get, and preferred to maintain their distance from the realities of their mission. Tommy Towery recalled "I knew of a few who were upset when they were informed how many people had been killed by their strike. Without that feedback, there was no guilt for those who had some Christian beliefs against killing their fellow men."[80]

SAC crews had to rely on the workings of the target selection process, and could transfer moral responsibility to a system that had to provide legitimacy, and over which they had no control. The Army picked the targets and airmen carried out the mission. The lengthy target approval process offered considerable process legitimacy if carried out as designed. A typical

---

[78] Col Carlton J. Koncz, interview by Jerry N. Hines, December 13, 1968, 43, Air Force Historical Research Agency, Maxwell AFB, AL.

[79] Johnson, interview, 65-66.

[80] Towery, E-mail message to author.

strike took three days to approve, and mandated checks for "non-combatants, religious shrines, or national monuments within one kilometer of the target. Appropriate agencies also verified that all structures in the area had been abandoned, destroyed, or converted to VC/NVA use. No friendly troops were to be closer than three kilometers to the target" at the time of the attack. Each Arc Light strike also required the approval of the local division commander, corps commander, three general officers at MACV headquarters, the SAC liaison element in Saigon, the Government of Vietnam, and Gen Westmoreland, the MACV commander.[81] Robert Rilling explained that at the level of the bomber or fighter crew, "in many cases we wondered" what the consequences were on the ground "but this isn't within our bailiwick. We don't have the knowledge to know if the target was correct or not" mandating a reliance on the system.[82] Although men like Rilling had no say on what they struck, they relied on the system to identify legitimate strike grids, and put forth their best efforts to ensure they put all their weapons inside the assigned grid.

Crews were fearful of dropping outside their assigned grids due to the consequences of a miss into a friendly country with their heavy bomb-loads, but also out of fear of SAC. As noted in the introductory chapter, Rilling completed one hundred missions in both the F-105 and the B-52, and observed that a great fear in the bomber was the consequences of missing the target. "The crew constantly cross checks to avoid [fratricide]...this is our biggest fear. I think every crew is scared to death that they may make a slip now and drop in the wrong place."[83] Navigator Robert Harder remarked that "there was zero room for error in this work; perhaps the greatest fear a Vietnam War bombardier had—even more than the threat to his own life—was that he might

---

[81] Pralle, *ARC Light Jun. 1967-Dec. 1968*, 15.

[82] Rilling, interview, 39.

[83] Rilling, interview, 37.

somehow make a mistake and kill friendly troops."[84] The consequences of a miss could be grave; a declassified annual internal compilation of Seventh Air Force "short round" incidents listed one B-52 drop in 1968 that put bombs outside the target grid and harmed civilians. An Arc Light mission on February 13, 1968 placed 65 percent of its payload outside the target box, killing forty-four, injuring fifty-seven, and damaging 278 structures.[85] In addition to the moral consequences of a mistake, crews had to face SAC's consequences. Back at home, inaccurate simulated drops experienced in training could lead to the revocation of a crew's select or experienced/elite rating.[86] In theater, crews might be sent home in shame for dropping outside the target box. Gunner George Schryer wrote that "all bombs on target was the holy grail of all our missions and any crew dropping their bombs outside of 'The Box' was sent home. I know of one crew who met that fate while I was there."[87]

Rather than fretting over morality, B-52 crews were more worried that their efforts were being wasted in worthless tree-splintering jungle attacks. Crews were doubtful about the effectiveness of many of their strikes, due in part to their tactical orientation and in part due to the questionable utility of many B-52 targets and lack of BDA. Tactical targeting was a far step down from SAC's cherished strategic purpose. Instead of attacking enemy nuclear sites or cities determined at SAC headquarters, SAC crews were reduced to bombing grids of featureless jungle

---

[84] Robert Harder noted that when safety buffers were changed from three kilometers to one kilometer during Khe Sanh, the nav team was very concerned because one kilometer equated to "three or four seconds on [the navigator's] stopwatch or "an almost imperceptible video distortion bloom" on the radar-nav's scope. Harder, *Flying from the Black Hole*, 113, 162.

[85] Schlatter, *Short Rounds, June 1968 - May 1969*, 26.

[86] Col Jim Hooppaw, a highly experienced B-52 pilot and aircraft commander recounts in his memoir how his select crew was downgraded and humbled due to an inaccurate training run during an inspection. Hooppaw, *Where the Buf Fellows Roamed*, 229.

[87] George Schryer, "150 Foot Bag Drag Times Four," in *We Were Crewdogs V*, ed. Tommy Towery (Memphis, TN: Tommy Towery, 2009), 159.

picked by the Army. One radar navigator sarcastically described the standard B-52 target as a "monkey killing/palm tree splitting/probable truck park/POL storage/transshipment point." Another assessed that "there were long periods from 1965 until early 1972 when it seemed like monkey-killing and matchstick-making were indeed the B-52's chief role in life."[88] Gen William Momyer, the Seventh Air Force commander in Saigon shared some of the same concerns over the profusion of B-52 delivered firepower as early as 1966 when he relayed his concerns to the Pacific Air Forces commander in Hawaii: "I think you would have to conclude the B-52's have been relatively ineffective…I have flown over many B-52 strike areas and looked at the results in detail. There has been no killing of large bodies of enemy troops, no destruction of quantities or enemy materiel, and no denial of territory to the enemy."[89] But Gen Westmoreland overruled Momyer. Westmoreland was Arc Light's greatest advocate and told crews at U-Tapao Air Base that "the B-52 was his heavy artillery and he considered it the most effective weapon he had at his disposal in the South Vietnam conflict" despite the skepticism of the crews and his Seventh Air Force commander.[90]

Lt Gen Selmon Wells, commander on Guam 1967-1968 recalled that prior to Niagara the B-52s were considered "jungle bombers" and "were not held too high in the light of accomplishing a lot." Once Niagara turned the bombers against enemy troop concentrations surrounding Khe Sanh and nearby Con Thien, the crews warmed up to their missions, felt appreciated, and the victory at Khe Sanh provided solid evidence that their bombing made a

---

[88] Harder, *Flying from the Black Hole*, 188; Bill Beavers, "Put Out the Arc Light, Free the POGs, and Other Personal Memories," in *We Were Crewdogs - The Vietnam Collection*, ed. Tommy Towery (Memphis, TN: Tommy Towery, 2008), 117-119.

[89] Jacob Van Staaveren, *Interdiction in Southern Laos, 1960-1968: The United States Air Force in Southeast Asia* (Washington, DC: Center for Air Force History, 1993), 191.

[90] Moore, interview, 3.

difference. Even the slightest evidence that they were helping troops on the ground established a connection to those troops and gave greater meaning to the bomber's role in the war.[91] Three years after Khe Sanh, James Hooppaw made a rare connection between his actions and the actions of those on the ground during his third Arc Light rotation during the abortive ARVN invasion of Laos in 1971. Inbound to the target, "the copilot asked me to come up on the other radio. I selected it and heard an F-4 talking to someone on the ground." The F-4 was strafing to keep a small ground force from being overrun. "He also relayed that while he did that, a cell of BUFs was laying down a strike as close as possible to delay a larger group of bad guys….I realized we were the BUF strike." Until that point, Hooppaw had never had the opportunity to see his actions as critical to the outcome of a battle or to the rescue of friendly forces. "We led the cell in and listened to the pickup after we laid down the strike. The guys on the ground got out. It was the most satisfying mission I ever flew. The results were immediate and we knew we had helped some guys in deep trouble."[92]

Lucrative troop concentrations like Khe Sanh were rare, and connections to friendly troops were rarer still for bomber crews, so to compensate for a lack of feedback, SAC turned inward to generating its own measures of effectiveness. Dr. Robert Kritt, a SAC historian during Arc Light, noted that "with the lack of BDA, the Air Division, of course, tried to keep a tap on the efficiency of its mission and came up with a mission effectiveness formula, which included launch phase, in-flight phase, and bombing phase, similar to an ORI [operational readiness inspection] stateside." Kritt recalled that one of the criteria to evaluate bombing accuracy called

---

[91] Lt Gen Wells assessed that with Khe Sanh, the B-52 "came into its own" and "from there on it has been accepted." Wells, interview, 8-9.

[92] Hooppaw, *Where the Buf Fellows Roamed*, 215.

for 80 percent of the bombs inside the target box.[93] Drop accuracy and adherence to SAC procedures (as already described) became the main measurement of Arc Light effectiveness. SAC also turned inward and used checklist adherence, crew coordination, and standardization as ways to evaluate B-52 bomb runs. Pilot James Hooppaw recounts several clashes with staff officers riding aboard his aircraft, who criticized his crew on a bomb run. After a mission, a radar navigator from the wing bomb-nav staff "observed we had crew coordination problems and asked that we meet with him to discuss them. His critique centered around the RN [radar-nav] and copilot." The staff officer criticized the pacing and intercom terminology used during the attack. "I explained that the crew, with the exception of Roddy [the copilot], had been together for over a year and were in sync. He then decided we would review the tape to prove his point." Hooppaw then used the tape to successfully defend his crew's performance, and turned the criticism onto the staff radar navigator for talking out of turn and interfering with the crew's execution of their bomb run.[94] Similar discontent with what seemed to be petty SAC criticism figured prominently in many crew recollections of Arc Light. Such concerns would be foreign to Southeast Asia's fighter pilots or FACs, who were primarily interested in the outcome of the bomb run. In contrast, Forward air controller J.R. Stearns inadvertently put his O-2 into a violent spin at the initiation of a rocket pass over South Vietnam. He quickly recovered, fired his smoke rocket, and cleared the waiting fighters to attack. The fighter lead appreciatively called over the radio: "Shit Hot, that was beautiful!"[95] Precise dive angles and airspeeds contributed to fighter and FAC accuracy, but did not become ends in themselves as they did within SAC.

---

[93] Wells, interview, 8-9.

[94] Hooppaw, *Where the Buf Fellows Roamed*, 162.

[95] Maj J. R. Stearns, "FAC Aerobatics," in *The Legacy of Daedalus: War Stories and Flying Tales*, ed. Lt Col Dale Shaw, Col Clement E. Bellion, and Lt Col Leon M. Shaddox (Paducah, KY: Turner Publishing Co, 2000), 215.

Risk and Arc Light: "Hours of Boredom…Instants of Pure Terror"

Unlike Rolling Thunder's fighter missions or the FAC's in the in-country air war, there was almost no tension between the mission and risks inherent to most Arc Light missions because external threats to the bombers were minimal. Boredom, safety, and SAC control figured more prominently than SAMs, guns, and MiGs on tens of thousands of missions flown over South Vietnam each year of Arc Light, easing the acute motivational challenges experienced in the fighter community. The forays into the fringes of Route Pack One and southern Laos heightened tensions due to the potential threats, but the Air Force blanketed any B-52 strikes with fighter protection, jamming, and Wild Weasel support to minimize the relatively low threats encountered there (where fighter pilots looked forward to "milk runs.").

At 30,000 feet over South Vietnam, there were no PAVN systems located in South Vietnam able to threaten Arc Light missions before April 1972. Only missions flown into or close to North Vietnam came near SA-2 coverage and SAC crews completed 112,000 combat sorties without a loss to air defenses through October 1972.[96] On 11 April 1966, B-52s joined the attack on North Vietnam by hitting supply lines in Route Pack One, the lightly defended, southernmost section of North Vietnam.[97] Crews on the first raid into North Vietnam were keyed up, concerned over potential defenses. Maj Alfred Foss was on this first strike on Mu Ghia Pass, which led from Route Pack One into Laos: "Yes, this was quite a memorable occasion. They briefed us for about

---

[96] Calvin R. Johnson, *LINEBACKER Operations, September - December 1972*, CHECO Contemporary Historical Evaluation of Combat Operations, December 31, 1978, 31, Defense Technical Information Center.

[97] Schlight, *The War in South Vietnam*, 150.

two or three days that something big was coming up and finally the word came through that we were going north. There was quite a bit of anticipation and anxiety. Along with this mission they gave us additional target study, E&E [escape and evasion] briefings, and so forth and left the general impression that a good percentage of the people wouldn't be coming back from this raid."[98] The mission was uneventful, and it was not until five months later in mid-September that the PAVN was able to fire an SA-2 at a B-52 (which missed).[99] Arc Light strikes into North Vietnam and the DMZ were infrequent, comprising only 4 percent of the 20,620 sorties in 1968. [100] From that first September 1966 missile attack, SAM engagements remained rare exceptions to the norm before the Linebacker Offensives. When the first bomber went down in November 1972, there had been only eighty-one (unsuccessful) missile engagements against B-52s in the six years in between.[101]

Strikes in and around North Vietnam's defended airspace skirted the periphery of PAVN's air defenses and enjoyed heavy electronic support, which further minimized the threat to SAC's bombers. Missions into defended airspace near North Vietnam enjoyed significant fighter, Wild Weasel and jamming support from Seventh Air Force F-4s, F-105F's or F-105Gs, and EB-66s. Seventh Air Force called the electronic jamming support packages "Tiny Tim." These substantial support packages protected the bombers, but created problems with the fighters during Rolling Thunder because sorties supporting bombers were unavailable to support higher risk

---

[98] Foss, Nash, and Langford, interview, 17.

[99] Lake and Styling, *B-52 Stratofortress Units in Combat 1955-73*, 33.

[100] Twenty nine percent of the Arc Light sorties in 1968 struck targets in I Corps—South Vietnam's northernmost military sector. After April, when the siege of Khe Sanh lifted, I Corps warranted only 17 percent of the Arc Light sorties. Pralle, *ARC Light Jun. 1967-Dec. 1968*, 66.

[101] By 1972, this averaged to one SAM engagement per 1,382 B-52 sorties. Johnson, *LINEBACKER Operations, September - December 1972*, 31.

fighter missions. SAC's risk aversion led to criticism from fighter crews because SAC required its bombers to abort their attacks and divert to a secondary target outside of SA-2 range if Tiny Tim support was lacking, or if the bombers detected SAM threats in the area.[102] Col J. A. Weyant, the SAC liaison chief to Seventh Air Force in Saigon observed that Tiny Tim support became a "thorn in the side of Seventh Air Force" because limited support aircraft were being pulled "away from Seventh Air Force strike sorties, missions that were up in a heavily defended SAM environment" to fulfill a precautionary role for SAC bombers. Weyant unconvincingly asserted, however, that "their attitude changed when it was made known all the way from Presidential level through JCS and so forth, that word was out, 'I don't want to lose a B-52 in that DMZ.'"[103]

Weyant and others repeated these concerns from Washington, but they may not have helped with the resultant loss of prestige from other aviators who faced tougher defenses with less support. That SAC kept the B-52s from high threat areas was a point of contention between fighter and bomber crews. Rolling Thunder's fighter crews derived honor and status from facing the defenses in Route Pack Six, and saw little basis for offering elevated status to bomber crews participating in Arc Light. Richard Baughn commanded two F-105 squadrons in 1965 and 1966 during Rolling Thunder and thought little of the aviators who flew over South Vietnam. "We called South Vietnam the "Big South Ranch" because the threat was almost zero. The best definition of a zero threat or probability of being killed was to fly on a B-52 mission over South Vietnam. There was no threat. It was like flying over north Texas and dropping bombs on Lubbock or something. We were losing our butts back then at a rapid rate and complaining like

---

[102] Captain Gilles Van Nederveen, *Sparks Over Vietnam: The EB-66 and the Early Struggle of Tactical Electronic Warfare* (Maxwell AFB, AL: Airpower Research Institute, 2000), 50.

[103] Col J. A. Weyant, interview by Jerry N. Hinds, January 19, 1968, 13, Air Force Historical Research Agency, Maxwell AFB, AL.

hell and going after nothing targets."[104] Robert Harder believed that as a result of the policy to protect the B-52s, "a sizeable percentage" of fighter pilots viewed the policy with great disdain, going so far as holding the decision personally against the Stratofortress aircrews." Although the bomber crews had no part in making the policy, "such talk stung."[105]

When bombers came under fire from SA-2s near the DMZ each crew member had a specific duty. The initial warning normally came from the electronic warfare officer, who monitored electronic receivers for indications that the SA-2's Fan Song had locked on, and then listened for the SA-2 missile uplink used to steer the missile in-flight. He countered the menacing beams with electronic jamming and chaff, but the B-52 was a huge radar target, and very difficult to hide. The navigator provided an escape direction as the aircraft commander muscled the controls hard over to turn away and descend. SAC regulation called for a steep descending turn (named the "falling leaf"), but some pilots reported far exceeding normal limits on the bomber in an attempt to dodge SAMs.[106] Even still, a steep bank was unlikely to create a meaningful amount of miss distance against a guided missile. Fighter crews dodging the same missiles reported needing four to five "Gs,"—well in excess of what a B-52 could handle—to get an SA-2 missile to overshoot. Although crews often refer to missiles passing where their aircraft had just been, the SA-2 possessed enough maneuverability to outturn any B-52. During a threat reaction the copilot warned the other aircraft in the formation so that other aircraft could take evasive actions. One copilot concerned about this duty reported writing the code words for SAM onto "four or five sheets of paper and on the window and a few other places so if you turn around on a DMZ

---

[104] A career fighter pilot, Baughn later commanded a SAC Air Division in New Hampshire in 1973. Baughn, interview, 143.

[105] Harder, *Flying from the Black Hole*, 184-185.

[106] George Robert Dempsey, "Just Another Flight," in *We Were Crewdogs - The Vietnam Collection*, ed. Tommy Towery (Memphis, TN: Tommy Towery, 2008), 83-84.

mission, you usually see code words" because "you've got three to six aircraft behind you" and "a person does tend to look out for the whole group. You're in the same ballgame."[107]

As noted in Chapter Four, historian Richard Holmes argues that under fire, a soldier's first instinct is to take action, either escape or direct action to counter the threat. This tendency held just as true for B-52 crews defending against SAMs as it did for the fighter pilots, although both groups were constrained in what they could do by their formation responsibilities or limitations of their crew station in a bomber.[108] In the air, crews could not take cover and hide as an infantryman might. Strapped into their crew stations, a B-52's crew did all they could to negate the threat, warn their formation, and survive the attack. A B-52 copilot remarked that time slowed when an SA-2 radar locked onto his aircraft and he had to wait ten seconds to complete his bomb run before starting an evasive turn. "Slow time: seconds pass like hours." He was eager to maneuver the bomber, even though he was skeptical of the effectiveness of "the silly Falling Leaf Maneuver that we'd been recently practicing…(as if anybody REALLY believed that would work)."[109] The radar navigator could look to identify the missile sight through his optics, and watch for additional launches. The gunner maintained visual lookout for more missiles. Crew E-05 from Fairchild AFB described a missile engagement in the DMZ on December 20, 1967 for SAC historians. The crew's well-coordinated actions clearly aided their ability to evade the missile attack, although it is interesting that the aircraft commander seemed just as proud of

---

[107] Foss, Nash, and Langford, interview, 4-5.

[108] S.L.A. Marshall argues some men freeze under fire due to unexpected isolation in combat, and that clear communications can overcome that tendency. An aircraft's radios and intercoms would keep an aviator in constant communications with his aircraft commander and flight leader in battle, solving Marshalls' key problem. Holmes, *Acts of War*, 223; Marshall, *Men Against Fire; the Problem of Battle Command in Future War*, 48.

[109] Larry Moeller, "First SAM," in *We Were Crewdogs - The Vietnam Collection*, ed. Tommy Towery (Memphis, TN: Tommy Towery, 2008), 49-51.

SAC's validation of his crew's reactions as he was of dodging the missile: "the colonel who was the ABC [airborne commander] in the lead aircraft said that the maneuver and everything was performed flawlessly. And our tape went to SAC Headquarters and they are using it for a training tape." The B-52's tactics, electronic countermeasures, Tiny Tim and Wild Weasel support enabled the bombers to operate without loss from enemy action until November 1972, after which PAVN air defenders shot down eighteen bombers in the final Linebacker offensives.[110]

Although PAVN air defenses garnered aircrew attention and focus during operations near North Vietnam, friction inherent to aviation claimed nearly as many bombers. Between 1965 and 1972, SAC lost twelve bombers to operational accidents during Arc Light. During the same period, B-52s flew 126,615 Arc Light sorties, for an accident rate just short of one loss per ten thousand sorties, making for a remarkably safe operation given its complexity.[111] Takeoffs were statistically the most hazardous phase of flight due to the narrow margins for error tied to the physics of getting nearly a half-million pounds of aircraft, fuel, and bombs to flying speed on a limited runway. Takeoffs claimed nearly half of the bombers lost in operational mishaps. Three crews aborted takeoffs and were unable to stop, three others took off but crashed on takeoff leg, and one of those three lost a wing right after liftoff and crashed into the sea north of Guam with all eight crew aboard killed.[112] Crews had to continually find ways to work around mechanical problems, although the wing failure was most distressing because no amount of skill or agency could have saved that crew. Robert Harder argued that "no matter whether the Stratofortress

---

[110] Most prominently, the Air Force lost fifteen B-52s between 18 and 28 December 1972 during the height of the offensive against Hanoi. The Air Force also lost three other bombers to SAMs, one falling on November 22, 1972, January 4, 1973, and then January 13, 1973. Lake and Styling, *B-52 Stratofortress Units in Combat 1955-73*, Appendix B; Hobson, *Vietnam Air Losses*, 240-247.

[111] Tommy Towery, ed., *We Were Crewdogs - The Vietnam Collection* (Memphis, TN: Tommy Towery, 2008), 5.

[112] Lake and Styling, *B-52 Stratofortress Units in Combat 1955-73* Appendix B; Hobson, *Vietnam Air Losses,* 240-247.

faced hostile fire or not, flying the beast was just plain dangerous work." He illuminated common problem areas: "aircrews on the rapidly aging bombers had to constantly deal with engine fires, hydraulic failures, electrical shorts, jammed landing gear, stuck wing flaps, smoke/fire in the cockpit, and, the most feared event of all—because absolutely nothing could be done about it—structural failure."[113] System malfunctions led to the loss of three bombers. One of the three lost its radome, which led to a loss of control, forcing the crew to bail out into the sea during a typhoon and a dramatic rescue via submarine. Four B-52s, as already noted, were lost due to midair collisions—two on the first Arc Light as the lead aircraft elected to circle to lose time en route to the air refueling track, the other two were lost while flying an unauthorized close visual formation.[114]

The long duration and high pace of Arc Light created a significant risk due to long-term operational fatigue. The eleven hour missions from Guam actually started four to five hours before takeoff. Crews planned and briefed their missions, attended a formal mass briefing attended by plenty of SAC brass, and then rode aircrew buses to their aircraft for a lengthy preflight. A tiresome aspect of preflight preparation included loading the crew baggage. Unlike a fighter pilot who carried little more than a helmet, a checklist, and some mission notes and maps, SAC regulations required B-52 crews to haul a staggering amount of baggage to the aircraft for every mission. An experienced aircraft commander described the typical baggage required for an Arc Light mission: flight helmets, headsets, and checklists, briefcases "with emergency procedures, a few appropriate regulations and hot tips in a small folder….The copilot had a

---

[113] Harder, *Flying from the Black Hole*, 186.

[114] One B-52 crewmember wrote years later that after the second midair, "Headquarters SAC suddenly became aware of the BOLD PRINT in the Dash One [flight manual] that said that flying the airplanes in close proximity to one another was prohibited." Capt Mike McGrath, "Mac's Facts no. 46 (B52 Combat Losses/Operational Losses in Vietnam)," accessed May 4, 2009, http://www.nampows.org/B-52.html.

complete Dash 1 [flight manual] and his flight gear. The nav team combined their manuals to just one set in one bag. In addition, we had the mission bag, chapkit box [survival gear], and a cooler for food and drink." Crews also loaded winter flight gear in case of a loss of cabin heat, and spare civilian clothing in case of an in-flight diversion. Intentional crew movements between Guam, U-Tapao, and Kadena mandated the addition of many of the crews' personal items, extra uniforms, and civilian clothes because crews did not retain their rooms when rotating between bases in theater.[115] Crews often encountered maintenance problems with various B-52 systems due to the age and complexity of the aircraft. In many cases, lengthy repairs forced crews to move to backup aircraft, precipitating "the dreaded bag drag" that included a hectic and urgent transfer of this immense amount of baggage between aircraft as the crew scrambled to get the new aircraft ready to go, during which "things could get lost easily, temporarily, or forever."[116] Bag drags made inherently long missions seem even longer—before even getting off the ground.

Once airborne and leveled off, crews described Arc Light missions as "very long" and "arduous."[117] Each five thousand mile round trip tested crew endurance. When asked to describe the flying from Guam, George Thatcher described it as "the definition of flying hours and hours of boredom punctuated by instants of pure terror…[but] for us, there really wasn't any terror involved."[118] The legs inbound to the target held greater interest for the crew with the air refueling join up, in-flight refueling, and the bomb run still ahead. Homebound legs were tougher as there was only the landing five hours distant to anticipate. Robert Harder wrote that "on the

---

[115] Hooppaw, *Where the Buf Fellows Roamed*, 119.

[116] James Hooppaw, "The Dreaded Bag Drag," in *We Were Crewdogs - The Vietnam Collection*, ed. Tommy Towery (Memphis, TN: Tommy Towery, 2008), 133-136.

[117] Fortney, interview, 7.

[118] Thatcher, interview, 16.

way over, the adrenaline had flowed pretty freely and time passed quickly, but the deadhead home was...excruciatingly long and boring. Within an hour, a deep fatigue had set in and everyone fought to stay awake. Trips to the pee can and coffee-pot started up on a regular basis."[119] Because the aircraft was lighter without bombs, homebound aircraft returned between 40,000 and 43,000 feet. Above 41,000 feet, regulations required oxygen be readily available, so the pilots had to fly with their helmets and oxygen masks (hanging to the side) instead of the more comfortable headset used during routine phases of flight, adding to their fatigue.[120] Several bomber crewmembers recount unavoidable sleeping incidents. Copilot J.J. Parker admitted to awakening to hear "yelling and all kind of noise on the radio" as the other aircraft in the flight tried to get his attention. Every man in his bomber fell asleep during a night transit, during which they slid from a trail position to "somewhere way out in front of the formation!"[121] As recounted in the introductory chapter of this dissertation, Robert Rilling flew both fighters and bombers in Southeast Asia, and he worried about staying focused for hours in the B-52. When "you're more or less fighting for your life" in the F-105, "you stay interested without any problem, where when you get hours and hours plugging away [in the B-52] and yet you have to get a high level of efficiency" which is "difficult to do."[122]

Guam-based crews normally rested for eighteen hours before returning to the air for another Arc Light mission. After several weeks, crews rotated to Kadena Air Base on Okinawa, or U-Tapao Air Base, Thailand. Both of these operating bases were appealing diversions from the

---

[119] Harder, *Flying from the Black Hole*, 145.

[120] Seberger, "Early Arc Light," 23.

[121] J.J. Parker, "Guam Moments," in *We Were Crewdogs - The Vietnam Collection*, ed. Tommy Towery (Memphis, TN: Tommy Towery, 2008), 241.

[122] Rilling, interview, 35.

monotony of Guam. Missions were hours shorter—six to nine hours from Okinawa, and four hours or less from Thailand. Thailand-based crews could operate on a normal 24-hour body clock and fly every day. Alfred Foss called flying from the forward bases "a sheer delight for most of the B-52 crews" because "we're flying sorties of three and four hours which is….just unheard of for 52 crews."[123]

Authority in Arc Light: Flying by the Book

Strategic Air Command's control dominated every aspect of flying in Arc Light. As already described, regulations dictated how aviators should interact as a crew, and SAC commanders validated their crew's bombing efforts and threat reactions by judging their level of compliance with SAC directives. Many SAC crews and their commanders took pride in their compliance, and valued checklist discipline and standardization to overcome the friction of operational mishaps and the effects of fatigue over the course of the lengthy campaign. The incredibly low B-52 Arc Light accident rate is a tribute to that professionalism. The SAC tanker commander at Kadena Air Base believed crews faced "many and varied" hazards including unfamiliar airfields, airfield construction, poor lighting, congested parking areas, round the clock operations, frequent adverse weather, and mass formations. He believed that SAC's adherence to standardized procedures gave his crews the tools needed to cope with adverse and unexpected situations. "It was this type of demanding environment [in] which the SAC standardization system really paid off. Without attention to previous training by the book right at the outset of operations, the mission could not have been done as effectively and safely as it was. This was

---

[123] One B-52 aircraft commander referred to U-Tapao as "U-Topia." Foss, Nash, and Langford, interview, 2; Jack Hawley, "We Were One Plane Ahead," in *We Were Crewdogs V*, ed. Tommy Towery (Memphis, TN: Tommy Towery, 2009), 180.

equally true in maintenance areas and provided the basis for a sound safety program."[124] B-52 pilot Dudley Morehouse, recalled intense study and testing on the SAC regulation governing Arc Light. "All we did was study 55-2 and that's all we knew about it [Arc Light]."[125] Memorization of SAC Regulation 55-2 was the ultimate expression of "flying by the book." SAC commanders expected their crews to know the rules, fly by them, and administered written tests to keep crews sharp. A favorite cartoon of Arc Light crews expressed a sarcastic but resigned crew reaction to SAC's relentless standardization. It "depicted a legion of Roman soldiers, all decked out in combat gear. In the foreground, a crusty-looking warrior in armor, holding a sword in one hand and the SAC lightning and palm leaves in the other [and] is saying 'Men, we are going to war …but first, a few written exams!'"[126]

Rigid adherence to rulebooks written at SAC headquarters in Omaha, inhibited flexibility, and it took the intervention of SAC generals to change the rules. SAC's monitoring and zealous enforcement created an environment of strict compliance. Alvan Gillem commanded Guam in 1968 and 1969 and "believed that one of the great strengths of the American Air Force—is that our senior commanders have always been pretty operational" meaning that they flew in combat. Gillem's predecessor, Maj Gen Crumm (who was killed in the 7 July 1967 midair collision) "changed the refueling formation by his own observations. I changed the bombing formation as a result of flying on one and coming home and saying, 'what in the world is going on?' and finding out the crews agreed with me."[127] There is a mixed message in Gen Gillem's observation; it is a

---

[124] Brig Gen Morgan S. Tyler, interview by Sgt Michael Pfau, September 10, 1968, 37-38, Air Force Historical Research Agency, Maxwell AFB, AL.

[125] Foss, Nash, and Langford, interview, 2.

[126] Hooppaw, *Where the Buf Fellows Roamed*, 135.

[127] Gillem, interview, 216-217.

great credit to Air Force generals that they stayed in touch with the mission and were able to make changes based on their first hand observations. The downside of his message is that mid- and low-level leaders who flew every day were unable to fix problems (that were so significant that they catalyzed a "what in the world" reaction from Gen Gillem) is a reflection on SAC's inflexibility and inflexible bureaucracy. SAC's regimentation, unfortunately, inhibited adaptation and in this case mandated general officer involvement to improve tactics. Not bound by a prescriptive tactics regulation, a fighter flight leader would have given little thought to changing his flight's formation, nor would he have thought to ask permission to change it.

Unlike the FACs who had to break the rules to be effective, SAC crews were far less prone to violate directives due to SAC's oversight, even if it had a detrimental impact on the mission. James Hooppaw recounted a mission where Wild Weasel support was unavailable, but was required by SAC regulation 55-2 because the target was close to the DMZ. Although the ultimate Air Force authority in South Vietnam, Seventh Air Force Headquarters (call sign "Blue Chip"), directed him to proceed without Wild Weasels, Hooppaw diverted his bomber formation to backup targets further south. "They repeated that Blue Chip said go; again, I refused. I was then asked for a reference. I gave them chapter verse and page number of SAC 55-2." Incredibly, Hooppaw recited SAC regulations to defy a TAC general in command of the air battle. Hooppaw saw compliance with SAC regulations as a higher priority than the immediate requirements of the air battle, and feared SAC's retribution more than any negative mission impacts. "I could have gone ahead and hit the primary target, but if anything had gone wrong at all, I would have been in deep doodoo for disregarding the manual." Perhaps the SAC crews' detachment enabled this kind of compliance. FACs, who were immersed in the battle and close to the troops were largely unable to put the rules above the mission as Hooppaw did: "I was taking no chances and played by the rules. No free style." After the mission, SAC commanders backed Hooppaw's obedience,

but changed the rule book. "Nothing was said at debriefing about the action I had taken, and I was not called to task for it. The following night the mission briefer gave an emergency change to SACM 55-2. The change said if Blue Chip said go, that overrode the instructions in the manual. I had no problem with that."[128]

SAC crews' total alignment with authority may also have its roots in their distance from the violence and danger in the war. SAC fought a war without passion. Physical and mechanical distance from the people, the enemy, and destruction the bombers wrought did not inflame the emotions evoked by flying at treetop level like a FAC and firing at a close and visible enemy. SAC crews had an abstract sense of the American troops they were supporting, but they fought without visual contact, without face to face interaction, and without even talking to ground forces on the radio. The bomber crews followed the precise commands of Combat Skyspot controllers, who guided them to a bomb release point in the sky, seemingly divorced from the target below. One pilot recounted responding to Skyspot vectors when a voice came over the radio "Hey knock off all that shit, we're trying to fight a war down here."[129] O-1 FAC Mike Cavanaugh, planned an Arc Light strike to support the ARVN in his sector, and was powerfully affected by the strike and its effects due to his ties to the sector and his proximity to the attack. Watching the strike, he called the bombers to come down to his altitude and observe the results of the attack after their bomb run: "'talk about detached, these guys were coming from Omaha. [laughter] I was down there chattering away, and they wouldn't even talk to me." Unlike Cavanaugh, the B-52 crews had no connection to the attack, and were not even tempted to see for themselves because they were carefully adhering to SAC routing in and out of the theater. "I'd say, "Green Cell, come on

---

[128] Hooppaw, *Where the Buf Fellows Roamed*, 214-215.

[129] Ibid., 114.

down here…you've got lots of gas. Why don't you come on down?' They'd say, [grumble] They had their orders from SAC headquarters. They were coming in at 30,000 feet over my little tiny province. It was a fly speck at 30,000 feet." Cavanaugh eagerly anticipated this requested strike for months and its impact astounded him. They "completely wiped out a whole Viet Cong regiment. It was carnage. It was total. That one B-52 strike after putting in months and months of fighters completely pacified the whole province. It devastated the whole Viet Cong backbone for the whole region." In contrast, Cavanaugh was surprised as well by the B-52 crews' detachment when he suggested they circle back over the target (as FACs did endlessly) to observe the results. "'Hey, you guys, oh, wow. Come on down and take a look.' They didn't even answer me. They were on the way back to Guam."[130]

The relative safety of the B-52's operations in Arc Light afforded additional emotional detachment. That the B-52s operated for seven years without a loss to North Vietnam's defenses meant that the powerful emotions of anger and sadness for lost comrades were seldom activated, except in operational mishaps. Fighter and FAC crews had to understand the war through the losses of their close comrades and make their sacrifice meaningful. The distance from war's passions led one electronic warfare officer to reflect years later (as noted in Chapter One): "I often ponder if I am a Vietnam veteran in the true sense of those words? I see the war footage and I know I didn't have it as tough as those who fought close combat in the jungles. I was also lucky that I never saw any of my friends of fellow fliers blown up. In my crew compartment as an Electronic Warfare Officer on the B-52, I was surrounded by racks of electronic equipment and

[130] Cavanaugh, interview, 112-113.

didn't even have a window to the outside world."[131] SAC crews, for the first seven years fought a war without passion, subject almost solely to rationality supplied by headquarters. SAC's intrusive oversight, however generated more emotion among many aircrews than did the battles fought at 30,000 feet over South Vietnam

The cost of SAC's premium on exacting precision, standardization and adherence was intrusive and constant monitoring. Staff officers often flew in the instructor pilot seat behind the pilots and acted as airborne commander (ABC) for bomber formations, and from this vantage point they provided detailed and pointed feedback on any and all aspects of the mission that they believed were inconsistent with SAC regulations. SAC's eternal vigilance towards its crews generated constant concern that decisions would be second-guessed and any communications less than perfect by the book would lead to criticism. Senior officers or staff ABCs could find inevitably some faults in a crew's procedures and report then up the chain, to which crews would have to answer. Gunner George Schryer recounted an incidence where the only fault a staff officer found after a mission was the crew's use of 'gunner,' 'guns,' "or on one occasion George" when addressing him. According to the staff officer "I was to be referred to as Staff Sergeant or Sergeant Schryer." [132] Differences in opinion might result in acrimonious disputes since reputations were on the line.

Concealment and in some cases, deception were responses to SAC's monitoring To avoid criticism, crews often circumvented the intercom system, shouting at each other or passing notes within the cabin. Navigator Robert Harder noted that although the intercom "could have made the

---

[131] Even as a participant in the final Linebacker raids, he still felt detachment: "I did get a sinking feeling though, when I heard that an airplane in a flight ahead of my B-52 was missing and believed shot down." Osborne, "Linebacker II--A Personal View," 167.

[132] Maier, "Kadena - X-Wind Launch," 160.

communications process a lot easier" the black holers yelled in "terse monosyllables and gestured animatedly in navigator-bombardier sign language" lest others question their proficiency.[133] In an interview with former Guam commander Lt Gen Andrew Anderson, historian Hugh Ahmann remembered "talking to one SAC pilot during this time," who described "one hell of a lot of note passing in those airplanes" to avoid the surveillance of SAC oversight "because they were going to be damned if they would say something on the tape recorder." Anderson was not aware of that but understood it. "That doesn't surprise me. If they found they were 40 miles off course and 5 minutes late, [a large deviation], they sure weren't going to announce it on the tape. They would just pass a note and work like heck to get back on course. That doesn't surprise me, but I never saw that on the missions I flew."[134] Anderson himself was party to playing the SAC game; in 1972 he prepared the newly re-opened base on Guam for a visit by Gen J. C. Meyer, the four-star commander of SAC, with Potemkin-like preparations geared to satisfy the commander. Meyer found a minor error in one maintenance record that had eluded Anderson's preparations. As a result, Meyer threatened Anderson with firing: "'I am going to be back in 3 weeks. Have your bags packed and ready to return back to the States when I land. If things aren't a hell of a lot better, you are going to go back with me. You've got a mess here. Clean it up!' Then he got back on his airplane."[135]

---

[133] Harder, *Flying from the Black Hole*, 134.

[134] Anderson, interview, 132-133.

[135] Anderson on his preparations: "I knew [Meyer] pretty well, and I heard his stories of the staff visits. Somebody would call me, like [Maj Gen] Larry Steinkraus and say: 'Now when the CINC comes out, he is going to ask you to take him to the battery shop, so for God's sake know where your battery shop is. He is going to inspect all your records, or he is going to pull a couple of records out to see if you have done all your time compliance tech orders, so make damned sure you have done that. He is going to judge you on these things.'" Ibid., 123-125.

The SAC culture drove many commanders to focus on minute details throughout their organizations, often pulling command focus away from combat operations. As the Air Division commander on Guam, Anderson was vexed by an endless stream of administrative issues elevated by his immediate boss, Lt Gen Gerry Johnson, the Eighth Air Force commander. As the B-52 Air Division commander, Anderson tried to get involved in operational issues, but "Gerry Johnson asked of me, 'What about that pistol that I hear was lost?' and all sorts of detailed questions that he shouldn't have been asking me in the first place." [136]

The commander's focus drove their staff and subordinate commander's perspectives, which could in turn generate resentment among the crews, when they perceived non-operational issues as priorities within their wings. As a result, tensions and motivational challenges during Arc Light arose between crews and their leaders. On Guam, it was difficult to escape that perspective because there were many senior officers manning the wing, air division, and Eighth Air Force staffs. Pilot John York wryly observed that Anderson AFB "had more colonels than should ever have been allowed. The joke at the officer's club was that there was a different full colonel in charge of the launch of each cell that launched out of Anderson AFB."[137] Nick Maier assessed that Anderson AFB was a "showroom war" because "the brass never knew who was going to drop in for one of these dog-and-pony shows, they insisted on strict military courtesies and behavior. That drove combat crews up the wall, since it was difficult to live their roles as 'Twelve o'clock High' bomber crew rowdies."[138] George Thatcher voiced visceral discontent

---

[136] The context makes it unclear, but this mission may have been part of Linebacker II, the final assault on Hanoi and Haiphong. SAC colonels flew as airborne commanders for the missions flown from Guam. Ibid., 118-125, 142.

[137] John York, "Arc Light Tour From Hell," in *We Were Crewdogs - The Vietnam Collection*, ed. Tommy Towery (Memphis, TN: Tommy Towery, 2008), 106-111.

[138] Maier, "Kadena - X-Wind Launch," 161.

with his wing staff. "Most of the line flying troops don't have a lot of respect for the upper echelons of wing staff. Who we always thought were a bunch of ass-covering careerists, who wouldn't change anything because they'd be afraid they'd make a mistake and let themselves in for criticism while they were covering themselves with glory and making their promotions. There was always that tension between staff and line."[139]

Crews had to toe the line, but they gladly enjoyed greater freedoms at Kadena and U-Tapao, and retained a slight sense of autonomy by participating in tiny acts of rebellion. Nick Maier equated a rotation to Kadena equivalent to "R&R," noting that his entire crew was "jubilant over the prospect of leaving the stuffy, formal environment of the Anderson AFB showroom war."[140] Jack Hawley referred to U-Tapao as "U-topia," and Marv Howell wrote an essay, "The Rules were Different at U-Tapao." Howell observed that the commander at U-Tapao in 1967 and 1968 was more relaxed about SAC's rules, enforcing infractions, and he had the distinction of flying one hundred Arc Light missions indicating a genuine operational orientation.[141] On Guam, with its stronger oversight, crews voiced small protests. Customized baseball ball caps (one electronic warfare officer called his "go-to-hell-ball cap") often replaced the regulation blue flight cap. James Hooppaw observed that "the baseball cap gave identity to individuals as well as units, which is surprising in the highly regimented Strategic Air Command. "The only rule was that it must be the squadron color with rank displayed, and not have obscene displays. There was the average run-of-the-mill cap and then there were those which showed some ingenuity and a sense of humor." Hooppaw recalled "one whole crew had their rank on the

---

[139] Thatcher, interview, 18.

[140] Maier, "Kadena - X-Wind Launch," 161.

[141] Hawley, "We Were One Plane Ahead," 180; Marv Howell, "The Rules Were Different at U-Tapao," in *We Were Crewdogs - The Vietnam Collection*, ed. Tommy Towery (Memphis, TN: Tommy Towery, 2008), 129-132.

front and the name 'Yossarian' on the back after the main character in the book Catch 22," presumably as a personal critique of their plight on Guam. "Most of the hats had innovative ideas and some were downright funny.…All in all, they provided an insight into the individual, and the crew in many cases.[142] Other signs of minor rebellion included the "free the POGs" (Prisoners on Guam) bumper stickers, out of regulation moustaches, or peace symbols on helmets.[143]

SAC's philosophy of centralized control delivered precise and tightly prescribed results over a seven and a half year campaign. The years of exact timing, accurate bombs on target, no losses to the enemy and very few operational mishaps are a tribute to the professional airmanship of SAC bomber crews and their leaders. Their achievements are remarkable because they were achieved over tens of thousands of bone-fatiguing flying hours, and required expert operation of very complex aircraft. The price of that performance was additional fatigue and irritation imposed by SAC's intrusive oversight and control. SAC's iron willpower imposed through its command philosophy was an antidote to the friction of day-to-day flight operations, but it exacted a toll on the SAC crews and wore down the aviators in the process.[144]

Motivation: "We Flew Number One Hundred and One and the War Went On"

The desire to fly brought SAC's crews into the Air Force as it had attracted their peers assigned to other aircraft types. Although they were initially motivated to fly, relatively few

---

[142] Hooppaw, *Where the Buf Fellows Roamed*, 308; York, "Arc Light Tour From Hell," 106-111.

[143] A large peace sign is prominently displayed on Lt Dave Hofstadter's helmet in the photo of the "author in his EW position" Dave Hostadter, "First Pave Bufs in Combat," in *We Were Crewdogs - The Vietnam Collection*, ed. Tommy Towery (Memphis, TN: Tommy Towery, 2008), 102.

[144] This observation was inspired by Clausewitz who wrote that: "countless minor incidents—the kind you can never really foresee—combine to lower the general level of performance, so that one always falls far short of the intended goal. Iron will-power can overcome this friction; it pulverizes every obstacle, but of course it wears down the machine as well." Carl von Clausewitz, *On War*, trans. Michael Eliot Howard and Peter Paret (Princeton, N.J: Princeton University Press, 1976), Book I, Chapter 7.

expressed a desire to fly in SAC or fly the B-52. Some pilots like George Thatcher sought SAC for career opportunities, instead of flying opportunities. Although he had several reasons to pick an assignment in SAC, and as noted earlier, he remarked "I chose bombers [over fighters] because I thought I could get promoted faster in bombers. I was thinking career, not thinking fun."[145] Most B-52 pilots sought the freedom, power and control of flying (i.e. the "fun" of flying), but went to B-52s because they had to, either due to low flying training ranking or due to changing Air Force pilot manning priorities. During pilot training William Tilton knew SAC took care of its people with promotions, but tried to avoid it. "Everybody knew [about SAC promotions], but nevertheless in my class we had one SAC aircraft and it went to the last student in the class. Nobody wanted it….They didn't want SAC and they didn't want a B-52." Tilton and his classmates understood many of flight's attractions were not available in SAC. "People thought SAC was a terrible place to be, that you didn't have any free reign and you'd be flying in very strict conditions that wouldn't be interesting and challenging and just be very routine."[146] Tilton's lowest ranking classmate, presumably went to B-52s due to his low performance in training. Two years later, many of P.K. Robinson's UPT classmates went to SAC due to their timing. Senior SAC commanders believed that they did not get an appropriate share of the new Air Force Academy graduates, because Air Force Academy graduates performed well in pilot training and were eager to fly fighters. "The first three classes out of the Academy went predominantly to fighters, and SAC, Strategic Air Command, kept saying, 'you keep sending all

---

[145] Thatcher also noted a desire to be assigned near his father, who was battling cancer. Thatcher, interview, 27.

[146] Tilton flew in Vietnam as a FAC, but he was subsequently assigned to SAC as a KC-135 tanker pilot. Tilton, interview, 15.

these Academy guys to TAC, and we need some of them at SAC.' So in typical Air Force fashion, they went all the way in the other direction, and our class went predominantly to SAC."[147]

Aircrews newly assigned to B-52 units faced the daunting challenge of quickly establishing their competency to their fellow crew-members and then SAC evaluators. A successful check ride and a high-pressure oral quiz (normally administered by the wing commander and his staff) earned a new crew an "R" rating signifying they were ready for combat. Upon his arrival on Guam, James Hooppaw admitted to worrying more about not measuring up in the eyes of others around him. "The biggest question in my mind, and I think in the rest of the crew's as well, was whether we could complete the mission as planned with no problems." As the aircraft commander, Hooppaw's apprehensions centered on his most trying pilot task, nighttime heavy-weight air refueling. "I knew the air refueling would be at night and the onload in the 100,000 pound range. I had confidence in my ability, but the thought of failing to get the gas was always in the back of my mind." Like G.I. Basel's concern over making a good impression on his first F-105 mission, Hooppaw wanted to make a favorable impression on the other crews and establish his credibility as a B-52 pilot. "This was one of the unwritten measurements of pilots in the BUF. The ability to get the gas was needed in order to complete the rest of the mission." Hooppaw needed to prove his competency to his peers as well as himself and build his self-confidence. "Each of us has his own level of conceit, and to some extent, thinks he is one of the best. Failure to live up to one's own expectations can be devastating. The word gets out as well. We all knew pilots who failed to make the grade in some way." To fail as a pilot might be survivable in SAC career-wise, but it undermined one's ability to lead. "It was always disconcerting to have someone who could not hack the job making policy and decisions

[147] The Air Force Academy's first three classes were the class of 1959, 1960, and 1961. SAC claimed the lion's share of the class of 1962. Robinson, interview, 9.

concerning the crew force, when it was known he had never even been an AC, instructor, flown a similar mission, or even had the responsibility for the results. Believe me, they are out there." Although bad flyers found their way into leadership positions, it seemed to have little effect on motivation. "Regardless, the need to have the respect of your peers can help overcome many obstacles, including the fear of failure."[148]

In combat, B-52 crews derived pride from accomplishing a difficult mission through precise teamwork. The B-52 was large and complex, and required expertise to fly. Careful adherence to the checklist ensured that crews missed no steps while operating the B-52 in Arc Light. The B-52's complexity generated mechanical problems that made the job tougher and reflected favorably on crew skill and expertise as they solved or found work-arounds in order to complete their missions. SAC's approach to forming "hard" crews, who lived and flew together for months, provided an opportunity for strong social cohesion to pull B-52 aviators together. SAC's incentives and punishment focused on driving the highest performance from each bomber crew.

Although the crews were proud of flying the B-52 and appreciated earning the respect of their peers and commanders, few cite instances of deriving many of flying's intrinsic rewards from manning the B-52. As already noted, some were proud of the B-52's unique niche in flying high and fast with a heavy bomb load, few comments reflect a high degree of autonomy, freedom, or flexibility. SAC's control extended into each aircraft, and yielded little opportunity for the crews to exercise their own judgment and agency during the war. The pilots could look forward to splitting a mere half-hour of activities they considered true "piloting" (takeoff, refueling, and landing) on each twelve hour mission to exercise some of their piloting skills, and voiced frustration at these meager opportunities. With SAC's aggressively prescriptive approach, there

---

[148] Hooppaw, *Where the Buf Fellows Roamed*, 129.

were few opportunities for crews to experience flexibility or freedom in flight. Combat Skyspot radar controllers (who were SAC ground personnel) specified headings, altitudes, and called when to release the bombs. Navigators had a higher payoff than the pilots because they worked vigorously to plot the bomber's position over the sea, calculate speeds and courses to keep the aircraft on time, and operate their complex radar, navigation, and bombing systems to put the bombs on target, on time, (although they lost agency on the bomb run to Combat Skyspot). Despite their difficult conditions in the black hole, the navigators took satisfaction in the knowledge that their unique expertise was absolutely essential to accomplishing the crew's shared mission.

The electronic warfare officers and gunners derived the least satisfaction from the tens of thousands of benign Arc Light missions flown far from North Vietnam and settled into menial tasks and second-class citizen status on the bomber. Once the PAVN began to challenge B-52 strikes in and around North Vietnam, the defensive team rose in stature. Electronic warfare officers became especially important with their receivers, jammers, radar-blinding chaff, and very specialized expertise in air defense systems and electronic countermeasures. Once under attack, the entire crew became energized and all sought to do their utmost to save the bomber. James Hooppaw was proud of his crew's effective response to a missile launch near the DMZ. "A second SAM had been launched and exploded above and to our rear. I could not have been prouder of the crew. Everything went just like we had trained. This was the acme of crew coordination. No one got excited there was really no time. The tape of the attack and our responses were later used as a training aid, as an example of how to do it."[149] Before the final bomber offensives, few memoirs and oral histories mention fear of enemy defenses (with the

[149] Ibid., 212.

exception of Foss's account of the first raid into Mu Ghia Pass in 1966), suggesting combat motivation—in the face of danger was not a significant issue before Linebacker. During Arc Light, fear of imperfection while under SAC's oversight was a more prevalent concern.

Fear of making a mistake—either unleashing the bomber's heavy payload in the wrong place or the possibility of violating SAC directives figured more prominently in many crew's daily calculus between mission and risks. Because the bomber's thirty-ton payload wrought a mile or more of destruction, the crews took every step to be absolutely certain their payloads hit within their designated target boxes. Any mission deviations, whether on the bomb run, or other less critical phases of flight attracted SAC's attention. Hooppaw recalled his crew's cohesion as they rallied to defend one of their own, not against the North Vietnamese, but against SAC inspectors. "We had been tested in many ways and had confidence in ourselves and each other, that was all very evident when all of us except the EW were taken into a room after our stan-eval ride and learned the unit was trying to take action against him for nodding off during a cruise portion of the ride." In the face of a threat, Hooppaw's crew rallied. "As a group, we informed the investigating officer that we had spent six months with him in a wartime environment and had complete confidence in him. We felt the whole thing was unfair. I was never prouder of the crew as when they stood with me in his defense." Their cohesive reaction prevailed and the matter "was dropped quickly."[150] The electronic warfare officer's sleepiness points to a major Arc Light challenge: long term fatigue and staying alert during the long missions from Guam.

Sustaining motivation was a unique challenge for SAC crews because they flew long, boring missions for six months at a time. The Air Force personnel system considered any deployment of 180 days or more as a "permanent change of station" that would invoke the one

---

[150] Ibid., 153.

tour policy, so SAC kept their deployments 179 days or less so that crews could rotate through the war several times. Without Southeast Asia credit, SAC crews did not enjoy the benefits of the Air Force's one tour policy that prevented involuntary second assignments to the war. SAC crews—especially B-52D crews—received involuntary orders for several Arc Light deployments. SAC headquarters requested credit for a Southeast Asia tour after five hundred days of cumulative temporary duty (about three rotations), but their request was not favorably received at the Air Staff and SAC dropped the issue.[151]

Cumulative, long-term fatigue hit the B-52D crews especially hard as Arc Light unfolded year after year. Due to the B-52's complexity, formal training was required to switch between different B-52 types, so the eleven wings within the B-52D community shouldered a heavy burden. The 3,500 to 4,000 B-52D aircrews of SAC's 11,520 combat-ready bomber crewmembers fought the war in Southeast Asia, with some crews deploying six or seven times. B-52 aircraft commander, Alfred Foss vented his frustration to a SAC historian in August 1968: "It seems that the D units have caught it, we particularly have been one of them, this is our third tour where many units in SAC have not been over here yet at all. This is a little too much as far as we're concerned and of course the units that haven't been over here are quite anxious to get over here, at least the first time."[152] B-52D navigator Robert Harder recalled that "by 1969 the pissing and moaning over those repeated TDY [temporary duty] rotations had gotten so loud that even the people down in the Omaha bunker [SAC headquarters] could hear it"[153] B-52D crews were concerned about the lack of equity within SAC. Between Arc Light deployments, Hooppaw and

---

[151] Gillem, interview, 172.

[152] Foss, Nash, and Langford, interview, 2.

[153] Harder, *Flying from the Black Hole*, 87-89.

others sought assignments out of the B-52D. "Naturally, we had filled out all kinds of [assignment] dream sheets as to where we wanted to go. Very few had chosen BUF bases which flew the black bellied D models. Thirteen out of 17 months of TDY were enough for a while." Reassignment was not enough for Hooppaw to avoid a third Arc Light rotation, which angered him. When squadron-mates, who were not deploying, asked for him to shop for them "I was a horse's ass about it. I said if they wanted something they could make the trip themselves. The ones who asked either had not been or were working hard not to go again.[154]

The Japanese government granted access to Kadena Air Base in 1968, providing a third B-52D operating base. The resultant increased demand for crews forced SAC to open a cross-training program to spread the war's growing and uneven impact on the B-52D crews. Brig Gen Alvan C. Gillem, a B-52 pilot, was the SAC director of operations at the time and was concerned that without adequate training, differences in aircraft systems created unnecessary hazards. "I didn't want to have to kill some of these guys to prove they didn't know the airplane." Gillem directed the creation of a short two-week familiarization course to allow crews to check out in the B-52D to augment Arc Light crews. With formal classroom preparation and four familiarization flights in the B-52D, "we never had any problem." Crews new to the D-model "fit right in."[155] With the opening up of a transition course, SAC spread Arc Light deployments across a larger population which improved equity and fairness in the eyes of the B-52D crews.

Crews complained of boredom and separation on Guam. Doug Cooper, a five-tour Arc Light veteran, wrote that "the things I remember about my Arc Light/Bullet Shot experiences are

---

[154] Hooppaw, *Where the Buf Fellows Roamed*, 186, 205.

[155] Gillem observed that crews from SAC's eleven B-52D wings "kept coming back and back and back." He started a training program to allow crews from other models to augment the D crews and it was "one of the smart things we finally did, [but] it took me too long as the SAC/DO to do it." Harder, *Flying from the Black Hole*, 89; Gillem, interview, 172.

being lonely and being bored nearly to death" because "the flying was really boring" and "recreational options on Guam were limited."[156] As years of Arc Light deployments accumulated, crews asked rhetorically "who will turn out the Arc Light?" Sarcastically leveraging growing national sympathy for the POWs in Hanoi, one wag printed bumper stickers pleading: "Free the POGs," which stood for "prisoners on Guam."[157] After each mission, crews stopped for a beer and a hot dog at "Gilligan's Island" an outdoor snack bar named for a popular 1964-1967 sitcom.[158] Although the palm-draped tables looked similar to the set of the show, a deeper connection existed between the Arc Light crews and the TV characters, who were lost, shipwrecked, and presumably forgotten on a deserted island in the Pacific. Shopping in Japan and Bangkok provided welcome diversions through consumption. SAC "war trophies" sought by Arc Light crew members included local furniture, jewelry, tailored clothing, electronics, and cameras. Many SAC families enjoyed the fruits of Arc Light rotations, until (as described by one crew dog) SAC base housing "looked like Pier One store showrooms." The strain of many long Arc Light deployments took a toll on SAC families. For some marriages, consumption was insufficient to compensate for time away from home, signified by the derisive comment that "the running joke during my time was that the three things you got on an Arc Light trip was a Seiko watch, a pair of brass candlesticks, and a divorce."[159]

Despite the personal costs of long repeated separations, SAC crews faithfully performed an arduous long-term mission with few visible signs of progress. Many cited a desire to fight

---

[156] Doug Cooper, "Memories of a Former Crewdog--Bored and Lonely," in *We Were Crewdogs - The Vietnam Collection*, ed. Tommy Towery (Memphis, TN: Tommy Towery, 2008), 112-113.

[157] Beavers, "Put Out the Arc Light, Free the POGs, and Other Personal Memories," 117.

[158] Cooper, "Memories of a Former Crewdog--Bored and Lonely," 113.

[159] Tommy Towery, "A Seiko Watch. a Pair of Brass Candlesticks, and a Divorce," in *We Were Crewdogs - The Vietnam Collection*, ed. Tommy Towery (Memphis, TN: Tommy Towery, 2008), 137-144.

communism, others noted an interest in defending the people of South Vietnam. Because the bombers were stationed offshore, these concepts could remain more abstract than those of aircrews stationed in South Vietnam, but these ideological underpinnings of their motivation were also more softly stated than those actually in country. Most bomber crews missed up close observations of how their actions might have been helping South Vietnam like those of the regional FACs assigned to support the ARVN, but they also missed observing the contradictions and failings of the Saigon government. Westmoreland, Abrams, and other ground commanders highly valued the Arc Light mission and crews, and heaped praise on their efforts. Westmoreland praised Arc Light as his reserve and heavy artillery while Abrams hailed the big bomber's ability to concentrate firepower and the crew's professionalism in being able to bring their attacks to within one thousand meters of friendly positions "I don't know what greater professional tribute that you could have. This is done routinely and it's because of the confidence that they [the battalion and brigade commanders] have in the precision with which you have always done your work, and I think it's quite a testimonial."[160]

As already noted, SAC crews did not enjoy the control and freedom of flight enjoyed by their peers in other aircraft types and major commands, but they did enjoy and value many of the secondary attractions of military aviation. James Hooppaw recalled his own desire to be the best at piloting the B-52, and to prove himself in the eyes of his peers by refueling successfully at night on his first Arc Light mission. Although SAC was unwilling to yield control and flexibility when it came to B-52 operations, SAC strongly reinforced these secondary motivators with preferential treatment and promotions. The SAC hierarchy told B-52 crews that they were the command's elite and those crews received preferential treatment. At U-Tapao, air traffic

---

[160] The transcript of this speech is dated 28 January 1968, but the context of the speech puts it in early 1969. Gen Creighton Abrams, "Speech to B-52 Crews U-Tapao AB," January 28, 1969, 12-13.

controllers cleared out other traffic for B-52s to return quickly to rearm. SAC extended this deference to other venues. Maj Billy Sparks ferried an F-105 through Guam en route to the States for major repairs. After a taxing three-hour flight through a typhoon, Sparks expressed his appreciation for his tanker crew with drinks at the Guam Officer's Club. As the aviators unwound, a lieutenant colonel B-52 aircraft commander "came in and told us we would have to leave since the [B-52] 'COMBAT CREWS' were coming in." Sparks (a two tour Rolling Thunder veteran wearing a 100-mission patch) saw no need for such deference, and threw a drink in the pilot's face and challenged him to fight.[161] The SAC KC-135 crew members, who were drinking with Sparks, wisely retreated from the confrontation, perhaps to avoid a fight, or perhaps out of deference to the higher ranking officer, or from deference to the B-52 "combat crews."

Career incentives within SAC helped sustaining motivation. SAC generals dominated the Air Force until the late 1970s and SAC tended to take care of its own.[162] SAC pilots made up most of the Air Force general officer ranks and SAC provided the surest path to senior command. SAC's career orientation extended to other aircrew positions. TAC C-130 loadmaster Ken Kruger believed that enlisted aircrews in TAC had few promotion opportunities compared to SAC refueling operators and gunners. "If you had made tech sergeant in SAC and you came to this troop carrier squadron, that was as far as you were going…you were done." Kruger recalled an instance where the enlisted airmen in his wing received only one promotion, "but when you opened the *Air Force Times*, there was E-8s, E-9s, E-7s, all going to SAC because they were

---

[161] A contingent of Air National Guard F-100 pilots reinforced Sparks until the Air Police closed the officers club. The SAC general on Guam gave Sparks a written order to leave the base. Sparks continued on to Nellis AFB, where the fighter general in command literally slapped him on the wrist as punishment. After the general's wrist slap, Sparks' immediate commander bought him a drink for "doing something all fighter pilots would like to do." Billy R. Sparks, "Something all Fighter Pilots Would Like to Do," in *First in, Last Out: Stories by the Wild Weasels*, ed. Edward T Rock (Bloomington, IN: AuthorHouse, 2005), 492.

[162] Worden, *Rise of the Fighter Generals*.

getting rid of their spot promotions. They were promoting everybody, so all these tail gunners and in-flight refueling guys in SAC, they were getting all the promotions."[163] Career opportunities may have outweighed flying opportunities for many SAC aviators. A 1967 Air Force survey that sampled the officer population indicated that 65 percent of all Air Force officers "planned to remain on active duty as long as possible" or to complete at least twenty years of service to secure retirement pay. The same survey found that "Twenty-year retirement and a love for flying are usually checked by a great number of officers as primary reasons for staying in the Air Force."[164] Capt Charles Haigh was flying AC-47 gunships when he was notified that he would be going to SAC B-52s. After "throwing things and screaming at the top of my lungs for five minutes" in disappointment, Haigh reflected "it all counts for 20 [years], I assured myself, pouring beer over my head and salt-encrusted flight suit."[165]

SAC's recognition with an Arc Light 100-mission patch failed to serve as the motivational badge of honor that so powerfully affected F-105 pilots in Rolling Thunder. Bomber crews noted combat milestones with 100-mission patches, but they lacked the meaning of their fighter-brethren's 100-mission patches. B-52 crews normally reached one hundred Arc Light missions on their second rotation into the theater. Attainment of the 100-mission mark warranted a small flight-line celebration that normally included a ritual wetting-down with buckets of water and the presentation of a patch from a senior officer. Crews were pleased to gain this recognition

---

[163] Kruger, interview, 20.

[164] Fringe benefits such as the commissary ranked third behind retirement and flying, while adventure and travel ranked fourth for officers. Enlisted airmen first ranked education, followed by retirement, benefits, and then adventure. Since only a very small population of enlisted airmen flew, flying would not be expected from a survey sampling all enlisted specialties. SMSgt Ed Kosier, "Reasons they Stay in the Air Force," *The Airman Magazine*, April 1967, 23.

[165] Charles Haigh, "LBII: Birthday at Angels Three Zero," in *We Were Crewdogs - The Vietnam Collection*, ed. Tommy Towery (Memphis, TN: Tommy Towery, 2008), 184.

but there was not the overwhelming sense of relief that the fighter crews experienced by simply surviving, nor was there a sense of joy because a bomber 100-mission milestone was not a ticket home. The fighter 100-mission patch was a badge of honor, evidence that the individual wearing it had satisfied an obligation of personal honor by repeatedly facing a mortal threat. The bomber patch on the other hand, signified a milestone of endurance on a grueling journey of indeterminate length. Hooppaw recounts his attainment of the 100-mission mark: "as the aircraft stopped for parking, it was surrounded by staff people and many buckets of water. When available, the commanding general would be present to hand out the hundred-mission patches after the wet down." As in Rolling Thunder, the commander's presence signaled a significant event. "When I stepped off of the ladder, I was herded together with the others who had completed the magic number. We were then doused with water over and over until we were soaking wet. The commander then presented us with our patches and a chit for a bottle of champagne each." But unlike fighter pilots who returned home after their hundredth mission over the north, bomber crews kept on flying until their rotation date. The patch was a milestone, not a goal. "The next morning we flew number one hundred and one and the war went on."[166]

For B-52 crews, the war went on, and eventually expanded into Laos, Cambodia, and North Vietnam. B-52s played an increasingly important role in the war against the Ho Chi Minh Trail in Laos after 1968. After suffering devastating losses during Tet, the PLAF's guerillas became less important to the war, as increasing numbers of PAVN regulars infiltrated south along the Ho Chi Minh Trail. As combat subsided in South Vietnam following the PLAF's decimation

---

[166] Note SAC's serious enforcement of the rules—instead of dousing crews with champagne and passing around a bottle, SAC presented chits for champagne at the officer's club away from the flight line. EW Tommy Towery placed the relative merit of a 100-mission patch in his description of the shopping opportunities in the Pacific: "one could wear a 35 millimeter Nikon camera around the neck with the same pride as a '100 Missions' patch on a flight suit." Hooppaw, *Where the Buf Fellows Roamed*, 166; Towery, "A Seiko Watch. a Pair of Brass Candlesticks, and a Divorce," 137-139.

during Tet, the U.S. Air Force's focus shifted north and west to interdict the increasing southward flow of men and material. When Gen George S. Brown, took command of Seventh Air Force from Gen Momyer in August 1968, 70 percent of his strike sorties supported operations in South Vietnam; a year and a half later, South Vietnam consumed 45 percent of his sorties, with the remainder going to the fighting over Laos.[167] B-52 crews joined with other groups of airmen, armed with increasingly sophisticated technology against the PAVN's lines of communication over the trail in Laos. How these new technologies impacted the interplay between mission, risk, authority, and aircrew motivation over the Ho Chi Minh Trail is the subject of the next case study.

[167] Gen George S. Brown, interview by Kenneth Sams and Lt Col Richard Knott, March 30, 1970, 114, Air Force Historical Research Agency, Maxwell AFB, AL.

Chapter 9: Fighters in Operation Commando Hunt

With the arrival of the annual dry season each November, hundreds of miles of trails making up the Ho Chi Minh Trail began to dry out, enabling thousands of trucks operated by resolute North Vietnamese drivers to haul men and material through the Anam Mountains in North Vietnam, through Laos, and into South Vietnamese battlegrounds. In November 1969, the onset of the dry season also heralded the resumption of an American aerial interdiction campaign to arrest and destroy those supplies.

One month into the 1969-1970 campaign (named "Commando Hunt III"), Boxer 21 and Boxer 22, a flight of two F-4Cs from Cam Ranh Bay, contacted a FAC, call sign Nail 21, orbiting near the hamlet of Ban Phanop, Laos about ten miles south of the infamous Mu Gia Pass. This heavily bombed pass was one of three prominent gaps connecting North Vietnam's Route Pack One with the Ho Chi Minh Trail in Laos, making it a site of great interest to both sides. Following the FAC's instructions, the F-4 crews dove towards a narrow two-mile long karst-rimmed valley to emplace a load of mark-36 antipersonnel mines along the north-south road running south from Mu Gia Pass.[1] As the jets completed their runs, thirty-seven millimeter and fifty-seven millimeter antiaircraft guns emplaced atop the jagged karst ridges lining the valley opened fire, achieving a lethal hit on the second F-4, Boxer 22. The pilot and navigator bailed out of the stricken jet and landed at the base of the karst on the east side of the valley.

---

[1] The Mk-36 mine was a Mk-82 general purpose 500-pound bomb modified with a magnetic fuse to allow it to function as an anti-vehicle mine. For the location of Mu Gia Pass, see Figure 1 in Chapter 3.

Relays of fighter jets and FACs gathered overhead and maintained a watch over the crew as a rescue force of helicopters and propeller-driven A-1 Skyraiders launched from Nakon Phanom, a U.S. base only 70 miles to the west across the Mekong River in Thailand. Once on the scene, the lead Skyraider pilot, call sign Sandy 01 (signifying a specially qualified rescue pilot), assumed control of the operation and directed strikes with bombs and smoke to prepare the area for a pickup. Despite the preparatory bombardment, the gunfire from the karst was intense, driving off the rescue force until the guns could be silenced. Heavy guns, housed in caves in the karst presented a major problem, warranting an attack by a flight armed with newly-available laser-guided bombs. Even laser-guided bombs failed to silence all the guns, which reappeared in other cave openings.[2] Four subsequent attempts to pick up the crew failed that afternoon as PAVN gunners damaged several American rescue helicopters, fatally wounding pararescueman David Davison.[3]

After a day-long battle between the American flyers and Vietnamese gunners, the rescue leader told Boxer 22 to hole up for the night, and that the rescue force would return for them in the morning. At first light on 6 December the battle resumed when a new aerial armada arrived over the valley, but the resumed rescue effort came too late for Boxer 22's pilot. During the night, North Vietnamese soldiers captured, and presumably killed, twenty-six year old Benjamin Danielson, whose screams were heard by his navigator, 1Lt Woodrow Bergeron, hiding nearby. Persistent anti-aircraft gunners again thwarted several rescues attempted throughout the next day,

---

[2] F-4 crews ultimately conducted twenty laser-guided bomb attacks against the guns around Boxer 22. When the bombs failed to knock out all of the guns, the F-4 crews aimed to bury the guns with debris from the karst overhead. Lt Bergeron, the navigator from Boxer 22 noted that one fifty-seven millimeter gun "took three days of everything to knock it out." Melvin F. Porter, *Second Generation Weaponry in SEA*, CHECO Contemporary Historical Evaluation of Combat Operations, September 10, 1970, 35, Defense Technical Information Center.

[3] "Home of the Jolly Green Association," accessed December 23, 2009, http://www.jollygreen.org/.

leading to a third day of effort on December 7, 1969. By this time, an American squadron commander at Nakon Phanom AB, Thailand, declared that "it got to be a personal thing between the (enemy) individuals on the ground and us."[4] By mid-day on the 7th, Maj Thomas Dayton flying as Sandy 07 (and on his third exhausting day of flying over the valley) estimated that the guns had been silenced by a three-day barrage of nearly 1,500 bombs, missiles and rockets, and it was safe enough to try another rescue attempt. He led two daisy chains of twenty-two A-1 Skyraiders into the valley to lay down two smoke walls for Jolly Green 77 to swoop in and make a successfully pickup of Lt Bergeron.[5]

The Air Force's official history assessed the three-day battle as the "largest search and rescue operation of the war to date," consuming 336 sorties, damaging ten rescue helicopters and five Skyraiders, and claiming the life of one pararescueman hit by ground fire. Significantly, the Air Force historian, writing in 1970, opined that "for the survivor, it was an indication of the amount of effort that would be expended to save a downed crewmember."[6] During Commando Hunt III, Seventh Air Force launched an average of 288 fighter sorties per day. That Gen George Brown, the Seventh Air Force commander, was ready to expend this kind of effort—more than an entire day's interdiction effort over the Trail—to retrieve a downed crew suggests the level of

---

[4] Lt Col John Schlight, *Rescue at Ban Phanop*, CHECO Contemporary Historical Evaluation of Combat Operations, February 15, 1970, 11, Air Force Historical Research Agency, Maxwell AFB, AL.

[5] For his courage under fire and leadership over the three day battle, Major Dayton received the Air Force Cross. In the words of Lt Col Albert Martin, the Sandy coordinator: "luck held and the wind died down, the A-1s laid their ordnance precisely on their respective targets, the smoke held its designed shape and a screen was formed. The screen was effective long enough to allow JG [Jolly Green] 77 to make a successful rescue." Lt Col Albert S. Martin, *SAR Effort Report (Boxer 22 Alpha and Bravo)*, Corona Harvest, January 16, 1970, Air Force Historical Research Agency, Maxwell AFB, AL; "Valor awards for Thomas Dayton: Military Times Hall of Valor," accessed January 7, 2009, http://militarytimes.com/citations-medals-awards/recipient.php?recipientid=3622.

[6] Schlight, *Rescue at Ban Phanop*, 13.

commitment towards looking after fellow Americans began to exceed the commitment toward winning the war.

Back in the United States, antiwar sentiments escalated throughout Operation Commando Hunt, but they provided no obstacle for American airmen. The shock of the Tet Offensive in 1968, the anger over the Cambodian incursion in 1970, and the failed Laotian incursion in 1971 brought groundswells of vocal and highly publicized criticism against successive administration policies, and traumatic incidents like the Kent State shootings captured American headlines. Yet Air Force crews dutifully carried out their missions over Southeast Asia. When Robert Mize flew F-105s over Laos in 1969 and 1970, he recalled there was not a lot of discussion over the pros and cons of the war, and that he and his fellow airmen "were 100 percent for it." Mize read about American attitudes through the G.I. newspaper *Stars and Stripes*, and was concerned he was out of step with other Americans back home and feared a confrontation. "When I came home on leave I was very apprehensive actually and wondering if somebody was going to stop me on the street if they knew I was there and say: 'Hey, what are you doing over there?' But no one ever did."[7]

Other airmen were more ambivalent about the war, but felt a responsibility to carry out their duties. During his B-52 tour, Robert Rilling told an interviewer in late 1968 that "what you personally might think or may not think about…the war or anything else is not a factor. As soldiers you're paid by your country and you're hired to do a job, and like the old adage, you know, 'right or wrong, my country.' So you do the job the best you can possibly do it."[8] Voicing a similar sentiment, C-130 pilot Gary Jackson recalled "most of the…guys I flew with, weren't

---

[7] Mize, interview, 23.

[8] Rilling, interview, 39.

questioning about this being the right thing to do." But offered "'my country, may she always be right, but my country right or wrong.' So whatever they were ordered to do, that's what they were going to do."[9] Gary Yarborough flew as a FAC over the Ho Chi Minh Trail in 1970 and reflected on, but dodged, the antiwar sentiments expressed at home. "I wondered if I ought to be feeling something negative. After all, *Stars and Stripes* ran daily articles on the antiwar outcry over the assault in Cambodia. Could it be that I was out of step in approving of the incursion? By approving, did that mean I felt no sense of loss or shame over the terrible shooting tragedy at Kent State?" Although he pondered the rift between himself and antiwar Americans, he elected to focus on the task at hand: fight, stay alive, and revel in the power control and freedom of combat flying. "I decided to leave morality to the folks back home, who had the time and luxury to consider it. My waking moments seemed to have room for only one reality-the trucks and the guns on the Ho Chi Minh Trail. I enjoyed the flying more than I ever could have hoped."[10]

The case study that follows opens with an overview of the Commando Hunt campaign, and then turns to the experiences of the pilots and weapons system officers who flew fighters over the Trail. The technology available to fighter crews in Commando Hunt changed their experiences from previous fighter experiences in Rolling Thunder. The Air Force was technologically unprepared for a conventional war at the opening of Rolling Thunder, but devoted tremendous effort to improving aircraft and munitions throughout the war. Many new technologies became available to crews flying in Commando Hunt between 1968 and 1972, and new technology shaped their experience of battle by altering the balance between mission and risk. Fighters equipped with advanced guided bombs allowed crews to execute precise and deadly attacks without exposing themselves to strong enemy defenses, but paradoxically, new weapons

---

[9] Jackson, interview, 30-31.

[10] Yarborough, *Da Nang Diary*, 47.

drew crews and their prey closer through telescopic, infrared, and low light sensors. At night, AC-130 gunships pulled together a range of innovations in weapons, sensors, and computers to transform big cargo aircraft into the most deadly killers to operate over the Ho Chi Minh Trail, which are the subject of the second chapter of this case study.

During the battle for Boxer 22, old technology mixed with new. A mixture of the Air Force's oldest and newest technology partnered to rescue Lt Bergeron. Korean-war vintage A-1 Skyraiders escorted newly-fielded HH-53 Super Jolly Green Giant rescue helicopters into the valley south of Mu Gia Pass to save one of their own from death or capture. The technological changes, mission, risks and authority of Air Force rescue forces are the subject of the third and final chapter of this case study. Rescue crews were highly motivated and accepted tremendous risks to save their fellow aviators in spite of growing discontent over the war at home. Men flew, fought, and died in Commando Hunt even though they did not believe their actions were leading to an American victory.

A shift in American attitudes towards the war affected the crews flying against the Trail. Airmen were willing to take substantial risks to save a fellow combatant on the ground, but were less committed to a campaign that seemed to promise a perpetual stalemate. Although American ground and air units withdrew from Southeast Asia throughout Commando Hunt, Air Force fliers remained committed to the war and expressed the belief that to win, the war needed to return to North Vietnam. But from 1968 to 1972, American aircrews waged an endless and increasingly unpopular war without a path to victory that posed substantial motivational challenges. An assessment of how these men remained motivated concludes this chapter and the two chapters that follow.

The Commando Hunt Campaign

Boxer 22's mission was to drop mines as part of Operation Commando Hunt—a campaign designed to stem the flow of supplies through Laos on the Ho Chi Minh Trail into South Vietnam. The aerial battle over the Trail began with periodic reconnaissance flights in 1961 that escalated to escorted reconnaissance, to a sustained, but limited, bombing operation in April 1965.[11] As American air forces increased their efforts against Hanoi though Rolling Thunder and against the insurgency in the south through the in country air war, the war over Laos was tightly constrained politically and militarily. Air operations over Laos were classified secret and subject to complex rules of engagement in an effort to preserve an appearance of Laotian neutrality and to protect Laotian civilians.[12] Likewise, the Royal Thai government sought to distance itself from the war and mandated an information blackout on air operations from Thai bases—which hosted the main effort over the Ho Chi Minh Trail—until 1968.[13] The war over the Trail was limited militarily due to the demands of the larger and highly visible air operations over North and South Vietnam.

In 1968, a major locus of aerial effort shifted from North Vietnam to Laos. President Johnson halted bombing in North Vietnam north of the 19th parallel on March 31, 1968, followed by a cessation of all bombing of the North on 1 November. The attention of many of these

---

[11] A 1961 reconnaissance deployment (code named "Field Goal"), involving a single converted T-33 trainer, was quickly followed by a four-aircraft RF-101 Voodoo deployment (called "Abel Mabel"). Deployments named "Yankee Team" followed in 1964 that included Laotian government-approved armed fighter escorts for Air Force RF-101 and Navy RF-8 over flights. Jeffrey D. Glasser, *The Secret Vietnam War: The United States Air Force in Thailand, 1961-1975* (Jefferson, NC: McFarland & Co, 1995), 17-33.

[12] How the Air Force arrived at a set of complex and sometimes frustrating set of rules of engagement is a major element of Jacob Van Staaveren's account of the Air Force's early years in Laos. His account of several missteps that led to tight restrictions is particularly instructive on pages 217-220. Van Staaveren, *Interdiction in Southern Laos, 1960-1968*, 217-220.

[13] Glasser, *The Secret Vietnam War*, 53-54.

Rolling Thunder forces shifted southwest to the Ho Chi Minh Trail. For two years prior to the bombing halt, Secretary McNamara had advocated a robust interdiction effort that formed a barrier from the Tonkin coast into the Laotian hills to cut lines of communication into South Vietnam. An early proposal prescribed ground troops deployments along the DMZ and then across Laos (on an extension of the DMZ line) to create a physical barrier, but was abandoned as impractical. The operation devolved to a high-tech array of electronic sensors backed by advanced air-dropped munitions including as many as thirteen million anti-vehicle and anti-personnel mines to form an electronic barrier enforced by air.[14] Although the services and Joint Chiefs opposed a costly static defensive effort, Secretary McNamara committed the department to the high-technology components, publicly announcing his intent in September 1967.[15]

Operation Commando Hunt integrated these emergent capabilities (named "Igloo White" in June 1968) including advanced air-dropped sensors and munitions, computers, a command and control center, and a range of aircraft to implement McNamara's barrier.[16] This first new campaign, named Commando Hunt I began November 1, 1968 and ran for six months until the return of the rainy season in May. American air crews fought Commando Hunt I in a permissive environment, as defenses over the Trail were limited, still concentrated in North Vietnam. Subsequent dry season campaigns featured increased applications of technology and innovations by both sides contesting trails and skies. Dry season campaigns carried odd numbers: Commando Hunt III (November 1, 1969-April 30, 1970), Commando Hunt V (October 10, 1970-April 30,

---

[14] These mines were button-sized, and called "dragon tooth" to counter vehicles and "gravel" for anti-personnel. Van Staaveren, *Interdiction in Southern Laos, 1960-1968*, 256-260.

[15] Evert Clark, "Barrier's Devices Could Detect Foe," *New York Times*, September 8, 1967; "U.S. Plans to Build Vietnam 'Fence' to Curb Infiltration From North, McNamara Says," *Wall Street Journal*, September 8, 1967.

[16] Jesse C. Gatlin, *Igloo White (Initial Phase)*, CHECO Contemporary Historical Evaluation of Combat Operations, July 31, 1968, vi, Defense Technical Information Center.

1971), and Commando Hunt VII (November 1, 1971-March 30, 1972). The Air Force conducted less prominent even-numbered operations (Commando Hunt II through VI) during the wet seasons, although they were deemed of limited impact and consequence because the trails became impassible to vehicles during the rains. Loyd King, operations officer of the AC-130 gunship squadron sent several aircraft to the States for modification during the 1971 rainy season and flew a few sorties over the Trail with his remaining aircraft each night. "We had a reduced schedule at that time, but we did cover all the areas just to make sure that the weather was bad."[17] Herman Gilster, a Seventh Air Force staff officer, analyzed Commando Hunt and wrote that logistic activity during the rainy season "was so low that the corresponding military operations could hardly be classified as campaigns."[18] The dry season campaigns were the main event, pitting American sensors, technology, and willpower against PAVN defenders and more importantly infiltrators, supplies, and most visibly, PAVN trucks.

The North Vietnamese Politburo committed the PAVN to operation of the Ho Chi Minh Trail in May 1959 with the creation of the 559th Transportation Group (named for the date of its creation). After 1968, the Ho Chi Minh Trail became increasingly important to the North Vietnamese war effort. When the Tet Offensive decimated PLAF cadres, the war shifted to increasingly conventional, heavy PAVN formations up to division strength, which required more substantial logistical support than lightly armed guerilla fighters. Although the communist forces utilized land routes through the DMZ, Laos, and Cambodia, and sea routes through the South Vietnamese coast and the Cambodian port of Sihanoukville, the Cambodian government severed

---

[17] Lt Col Loyd J. King, interview by Lt Col Vaughn H. Gallacher and Maj Lyn R. Officer, February 8, 1973, 11-12, Air Force Historical Research Agency, Maxwell AFB, AL.

[18] Herman L Gilster, *The Air War in Southeast Asia: Case Studies of Selected Campaigns* (Maxwell Air Force Base, AL: Air University Press, 1993), 19.

a major supply artery through Cambodia when Lon Nol deposed Norodom Sihanouk, shifting even greater weight to the land routes through Laos. Over the years, robust sector sub-commands called Binh Trams administered, improved, defended, and operated the Trail system. An estimated forty to fifty thousand men and women worked along the Trail continuously operating the trails, way stations, truck parking areas (or "truck parks"), maintenance facilities, anti-aircraft units, trucks bridges and barges, and a command and control network.[19] Groups infiltrating on foot found way stations roughly a day's march apart. Drivers assigned to Trail sectors became experts on the primary and alternate routes through their sector making the transportation net more resilient. American POWs, in their transit to imprisonment in Hanoi noted how enterprising the operators of the lines of communications took brief warnings of approaching aircraft and directed trucks into hiding places along the road net.[20]

The Ho Chi Minh Trail network crisscrossed 1,700 square miles with an estimated 3,500 kilometers of drivable dirt, gravel, and corduroy pathways.[21] Jungle canopy and vegetation hid many trails from aerial observation, and provided cover for the truck parks and en route supply stores. The broken western slopes of the 6,000 foot-high Annamite Mountains separating Vietnam from Laos, provided numerous valleys to hide lines of communications, while the peaks provided elevated positions for antiaircraft gunners and spotters, and created hazards to aircraft in darkness or poor weather. Rivers and streams divided the area, hindering movement in the dry season, but providing an alternative source of transportation in the wet season. Although American planes quickly dispatched fixed bridges, PAVN engineers became proficient in

---

[19] Ibid., 16.

[20] Johnson, *Captive Warriors*, 43-44.

[21] Gilster, *The Air War in Southeast Asia*, 16.

developing fords, pontoon bridges, ferries, and underwater bridges that had their structures built a foot or two below the surface to hide them from aerial surveillance. Many elements of the Trail were plainly visible to forward air controller Frederick Nyc on his first mission over southern Laos in 1968. "We could see the famous Ho Chi Minh Trail and its tributaries quite well in the green jungle. The white limestone road showed up well and appeared irregular in size due to the bomb craters scattered across the landscape. As the Trail crossed small streams, the devastation was more noticeable. Presumably this was caused by catching the trucks ready to ford the rivers, or perhaps it was someone's effort to blow up the underwater bridges built on every stream."[22]

An organization located at Nakon Phanom named Task Force Alpha operated the sensor grids over the Ho Chi Minh Trail. EC-121R "Batcat" reconnaissance aircraft monitored the sensors and relayed the results to the Task Force Alpha complex for analysis. Analysts used computers and large display boards to identify, plot, and predict traffic on the Trail. The mission was generally centered on "intelligence gathering and targeting." Although Task Force Alpha attempted real-time command and control twice during Commando Hunt, it enjoyed only mixed success and it had to relinquish control to a more decentralized system after both tries.[23]

Task Force Alpha and Seventh Air Force directed a host of aircraft over the Ho Chi Minh Trail. Fighters and FACs flew the most missions over the Trail, and are the subject of the reminder of this chapter. Night operations over the Trail were dominated by a squadron of AC-130 gunships, whose crews are the subject of the second chapter in this final case study. The case

---

[22] Nyc piloted a C-130 (call sign "Blind Bat") modified with a night vision scope and flares to find activity on the trail at night and to illuminate the trail for other strike aircraft. His first mission provided a glimpse of the trail just before sunset. Nyc, *Blind Bat*, 50.

[23] Henry S. Shields, *Igloo White, January 1970-September 1971*, CHECO Contemporary Historical Evaluation of Combat Operations, November 1, 1971, 15, Defense Technical Information Center.

study concludes with a third chapter on the rescue crews who flew to save their comrades from death or capture.

The Fighter Mission Over Laos: "Attack When You Find Them"

Although the interdiction of the Ho Chi Minh Trail presented many frustrating challenges, fighter crews accepted the mission as a relevant one. This chapter describes how these outspoken aviators were not reluctant to voice their opinions on how they thought the war ought to be fought, and by 1969, few believed the war was on a pathway to victory, but they were able to derive sufficient personal satisfaction from flying in combat by focusing on the technical and tactical challenges of their mission. Threats posed by PAVN air defenders in Laos were more lethal than those encountered over South Vietnam, but far less formidable than those faced in North Vietnam during Rolling Thunder, which eased motivational challenges. But over the successive Commando Hunt campaigning seasons, the threats in Laos multiplied. Crews and their commanders applied two broad approaches to reconciling the growing tension between the fighter mission and risks, first by adopting risk-limiting tactics that sacrificed mission effectiveness, and second by applying emerging technologies that allowed them to attack targets effectively from higher (and safer) altitudes.

Technologies eased motivational challenges by killing from increasing distances and limiting risks. Technology also changed the distribution of power within fighter cockpits, giving navigators legitimate fighter roles. Fighter crews were less frustrated by authority than they had been in Rolling Thunder because they fought with relatively few constraints over the Trail. The rules of engagement were complex, but generally allowed attacks on most targets discovered along the Trail, and did not proscribe attacks against air defenses—the two most significant sources of bitter frustration during Rolling Thunder. Lower combat losses and a vigorous

organizational commitment to recover airmen shot down over the Trail helped reduce frustration with authority even further when compared to Rolling Thunder.

Three groups of airmen flew in Commando Hunt: new pilots and navigators, experienced fighter pilots, and experienced cargo and bomber pilots and navigators cross-trained into fighters. All three groups were driven by a common passion for the power, control, and freedom of flying that gave them an opportunity to test themselves and apply their unique skills towards a challenging mission. All should be considered volunteers: new aviators took action to get into an Air Force cockpit during wartime, while the older crews could have fulfilled their service commitments and left the service for civilian positions by the end of Commando Hunt's first year. Highly proficient fighter crews had the opportunity to volunteer for elite jet forward air control missions (spurred by the Misty FACs and which propagated throughout the theater in 1968 and 1969) that afforded them greater agency and autonomy than was the norm for most fighter crews in Commando Hunt. Even though Air Force personnel policies were not oriented towards generating unit cohesion, fighter squadrons became more conducive to reinforcing strong social bonds, and successful aviators bonded and were buoyed by their peers in high-spirited fighter squadrons while unsuccessful flyers were shunted off to staff positions at higher headquarters.

Fighter crews understood their mission was to interdict supplies flowing along the Ho Chi Minh Trail. Although Seventh Air Force and MACV closely tracked truck traffic along the Ho Chi Minh Trail, the PAVN was expert at concealing movement and repairing damaged vehicles, which called any quantification into question. Because the PAVN was especially proficient at hiding supply-carrying trucks in the daytime, Seventh Air Force sent its fighter crews to bomb river crossings and mountain roads to slow and funnel road traffic into nighttime

kill zones where gunships equipped with night vision systems could find and destroy them.[24] Daytime crews also sought out road repair crews and equipment to hamper repairs and dropped aerial mines to kill or deter repair crews. Because the infrastructure was very primitive, road cuts often did little more than rearrange rubble, so bulldozers were highly valued targets. Due to the tenacity of the North Vietnamese road crews, some American aviators were keen to attack them. Jack Doub, an F-100F Misty FAC observed a huge dust cloud created by hundreds of road workers attempting to re-open a mountain road cut by bombs. "There were literally hundreds, perhaps thousands of troops hustling that red dirt down the mountain." He called for fighters and led them on a successful strike, and afterwards he proudly mused "I knew this was a major body count, perhaps the biggest of the war? I gave the F-4 jock a battle damage assessment of 3-400 KBA (killed by air) out of an estimated 1,000 troops" and noted that the next day, uncharacteristically "the road remained closed" due to the losses suffered by the repair crews.[25]

Gen George Brown, took command of the Seventh Air Force in August 1968, three months before the opening of Commando Hunt I. Brown directed the battle over the Trail, but had no illusions he could shut it down by only hunting trucks. "The way you make the greatest impact on him is to make it just as expensive as you can for him to send a single truck down." He identified the major elements of the Ho Chi Minh Trail as parts of an interconnected system and used his fighters to attack the visible elements of the system in daylight. He believed Seventh Air Force could make the greatest impact by "attacking his total system—you attack trucks when you can find them; you attack what is on the road [and] in truck parks; you destroy supplies when you

---

[24] Gen William Momyer estimated that his gunship crews achieved 90 percent of Seventh Air Force's truck kills at night. Momyer, *Airpower in Three Wars*, 229.

[25] Maj Gen Don Shepperd, *Misty: First Person Stories of the F-100 Fast FACs in the Vietnam War* (Bloomington, IN: 1st Books Library, 2002), 404-405.

can find them; you destroy his anti-aircraft artillery and you kill his people manning the guns; you destroy his road works where they're critical and his water works where they're critical; and you kill the people working on the roads. You're just after the total system."[26]

Although some crews expressed frustration with Gen Brown and policy-makers in Washington D.C. for not going after the North Vietnamese logistics system at its root (in North Vietnam and its rails and harbors), they were willing to accept their mission as a suboptimal but a relevant one and flew their jets against the challenges posed along the Ho Chi Minh Trail. Two-tour fighter pilot Tim Ayres believed that "our hands were tied" because "you knew where supplies were coming from, and all you'd do is…go out and make a cut in a road or bring in air strikes on a suspected supply area" when more meaningful targets were available in North Vietnam.[27] Capt Albert Clark flew against the North's trucks in Route Pack One at the end of Rolling Thunder, and then shifted to Laos with the overall U.S. air effort. "It's ridiculous to try and do what they're doing,…I think that the interdiction program is about as successful as it could be with all the limitations that are imposed but that's not very successful….they should either forget about it or they should cut it off at the source rather than trying to find 10,000 trucks spread out over 50,000 or so miles of road which goes through jungles."[28] But political constraints limited air strikes against the North to a few limited efforts against air defenses in the lower route packs.[29] Despite his frustrations with the overall mission, Clark found satisfaction in

---

[26] Gen George S. Brown, interview by Maj Richard B. Clement and Capt Ralph G. Swenston, October 20, 1970, 108, Air Force Historical Research Agency, Maxwell AFB, AL.

[27] Ayres, interview, 11.

[28] Capt Albert P. Clark, interview by Maj Samuel E. Riddebarger et al., June 12, 1969, 16-17, Air Force Historical Research Agency, Maxwell AFB, AL.

[29] A gradual and officially unsanctioned expansion of those strikes led to the dismissal of Gen John Lavelle in April 1972. Gen John D. Lavelle, interview by Lt Col John N. Dick, April 17, 1978, Air Force Historical Research Agency, Maxwell AFB, AL; John Correll, "Lavelle," *Air Force Magazine*, November 2006.

developing new tactics and adopting new technologies to his missions over the Trail. Although he believed many of his peers left the Air Force in frustration during Commando Hunt, he elected to remain in the Air Force and upgrade from the back seat to the front seat of the F-4 "because I really like to fly airplanes and I really like the Air Force"[30] Clark and other American aviators faced a diminished threat over the Trail compared to their recent experiences over North Vietnam, easing their decisions to stay in Air Force combat cockpits.

Risk: "We Weren't Sure Whether We Were Being Shot At"

The risks posed by PAVN defenses were minimal in early Commando Hunt campaigns, but multiplied over successive campaigning seasons. Initial American efforts were met by defenses similar to those encountered over South Vietnam: small arms, light twenty-three millimeter guns, and a few thirty-seven millimeter antiaircraft batteries. John Amos Parker flew a reconnaissance RF-4 in Commando Hunt I and II and during his first exposure to combat he did not even perceive any of these defenses. "We must have flown 30-40 daylight flights" but due to his inexperience and the light defenses "we weren't sure whether we were being shot at or not, to tell you the truth." It was not until he flew at night before he began to notice antiaircraft fire.[31] Other inexperienced crews, un-blooded by Rolling Thunder, tended to overstate the (initially) light defenses they encountered over Laos. Capt Clark, who participated in both operations,

---

[30] Capt Clark, son of USAF Lt Gen A.P. Clark, was an Air Force pilot and voiced as much dissatisfaction with being assigned the back seat of an F-4 for an extended period as his dissatisfaction with the course of the war. Despite his frustration, with an upgrade to the front seat pending, Clark deemed the flying was worth the prospects of another likely Southeast Asia tour tied to his move to the front seat of an F-4. Clark, interview, 2-6, 61.

[31] Parker then switched to night-flying where the defenses were more visible "and from that time on we were able to identify ground fire and I'd swear that every damn time I flew I got shot at. But, at night, it's really spectacular and it's scary as hell." Parker, interview, 30.

observed "you didn't expect to get shot at every day in Laos. A lot of new people that came after the bombing halt never had experience in North Vietnam, had nothing to judge what was a little bit of AAA and what was a lot, what was 20 rounds and what was 300 rounds, and I think that the estimates of AAA became very exaggerated as the people who were experienced with North Vietnam started leaving."[32]

For fighter crews, tactics, technology, and lighter PAVN defenses made Commando Hunt an order of magnitude safer than Rolling Thunder had been at its peak. During the last year of operations in Route Pack Six, Seventh Air Force lost an average of 7.2 strike fighters per thousand sorties. A half-year later, Commando Hunt I experienced .63 losses per thousand sorties—statistically, operating over the Trail was ten times safer than "going downtown." A year later, in Commando Hunt III, aircrews experienced a slightly higher loss of .74 aircraft shot down per thousand sorties.[33] Although there was a far lower chance of being shot down over Laos, the consequences were far worse than over South or even North Vietnam because the Pathet Lao were not known for taking prisoners. Jerry Fleming noted the pilots in his squadron "felt pretty much that to go down in Laos meant either being rescued or not being taken prisoner, in other words, being killed."[34]

Over progressive campaigning seasons, defenses multiplied with the introduction of more and heavier guns. Seventh Air Force intelligence estimated, that Commando Hunt III crews faced 743 guns, over one hundred more than the previous dry season, including huge one hundred

---

[32] Clark, interview, 29.

[33] John Schlight, *Jet Forward Air Controllers in SEAsia*, CHECO Contemporary Historical Evaluation of Combat Operations, October 15, 1969, 20, Air Force Historical Research Agency, Maxwell AFB, AL; Bernard C. Nalty, *The War Against Trucks: Aerial Interdiction in Southern Laos, 1968-1972* (Washington, DC: Air Force History and Museums Program, United States Air Force, 2005), 130.

[34] Capt Jerry Fleming, interview by Maj Lyn R. Officer and Hugh N. Ahmann, February 21, 1973, 85-86, Air Force Historical Research Agency, Maxwell AFB, AL.

millimeter guns on the eastern, off limits side of Mu Ghia and Ban Karai Passes, which straddled the North Vietnamese and Laotian border.[35] By Commando Hunt VII in 1971-72, some estimates put the number at 1,500 guns, which were bolstered by SAMs and occasional MiG forays into Laos.[36] Despite the increased defenses, Air Force losses fell over successive Commando Hunt campaigns. During Commando Hunt I, PAVN gunners brought down 56 Air Force aircraft. Three years later, twice the number of PAVN guns brought down only thirteen aircraft in Commando Hunt VII (although another ten were hit by a new and growing SAM threat in southern Laos).[37] Although Air Force fighter strength in 1971 was only half that of 1969, that losses generally tended downward throughout Commando Hunt indicate two more important dynamics: first, crews and their leaders made risk limiting decisions favoring force preservation over mission effectiveness; and second, technology began to lessen the correlation between mission effectiveness and risks over Laos by improving bombing accuracy between 1968 and 1972.

Seventh Air Force crews and commanders responded to the mounting threats with risk-limiting measures. Seventh Air Force generals felt constrained by the climate at home. In January 1970, the Seventh Air Force Director of Operations became concerned over mounting jet FAC losses and informed the wing commanders "if we don't cut down losses and hits we may lose the program altogether."[38] Concerned that losses might lead to top-down guidance to halt some flight operations, Seventh Air Force restricted older and more vulnerable aircraft to night operations where they might operate unseen by antiaircraft gunners, or pushed them out of the skies over the

---

[35] Nalty, *The War Against Trucks*, 130.

[36] Ibid., 215.

[37] Ibid., 218-219.

[38] Monte D. Wright, *USAF Tactics Against Air & Ground Defenses in SEA: November 1968 - May 1970*, CHECO Contemporary Historical Evaluation of Combat Operations, September 25, 1970, 28, Air Force Historical Research Agency, Maxwell AFB, AL.

Trail altogether. C-130 transports converted to gunships limited their operations to night missions over the Trail, and Seventh Air Force assigned them fighter escorts each night to counterattack antiaircraft sites encountered along the Trail. Obsolescent T-28 armed trainers and A-1 Skyraiders pulled back from interdiction missions over the Trail in 1969, after which the Seventh Air Force limited U.S.-piloted Skyraiders to a rescue role.[39] This shift was partly to preserve the diminishing fleet of prop-driven A-1s for the rescue mission (for which they were uniquely suited), but it also indicated a willingness to accept the risks in an old, slow and vulnerable aircraft when retrieving an aircrew, but an unwillingness to accept risks on an interdiction mission. From 1968 onwards, fast, maneuverable, and capable two-seat jet fighters assumed a growing share of the forward air control duties from the low and slow propeller-driven FACs which had operated over the Trail since 1965. Most Seventh Air Force crews mirrored their headquarters growing conservatism. Crews accepted these limitations more readily than fighter crews had in Rolling Thunder or the FACs had over South Vietnam because Commando Hunt's airmen did not believe they were fighting to win and there were fewer emotional connections to friends lost or to men on the ground that spurred action as described in the first two cases, so many resolved to survive the year and enjoy the flying as best they could.

Flying Fighters Over the Trail: "Don't Lose an Aircraft"

Daytime fighter attacks used high-altitude dive-bomb tactics the same as those used over North Vietnam at the close of Rolling Thunder. High altitude dive-bombing minimized exposure to antiaircraft fire, but came at the cost of lower accuracy. Three-tour veteran Lawrence Boese

---

[39] The Vietnamese Air Force continued to operate U.S.-built Skyraiders in a strike role. Air Force Skyraiders were uniquely valuable in the rescue role because they operated at the same speeds as the rescue helicopters and because they carried large payloads and had long loiter times to enable prolonged rescue battles like that over Boxer 22.

described the standard dive-bomb tactic in risk-limiting terms: "all the attacks were high altitude/high 30 degree (night) and 45 degree (day) dive angle deliveries. Normally we would be about 18,000 feet, roll in, try to get between 45 and 50 degrees of dive, deliver around 7,500 feet above the ground so that you could recover 4,500 feet above the ground. The reason for this delivery tactic is most small arms or small caliber AAA would top out at about 4,500 feet, so we would recover above it. The steeper the dive angle gave you more accuracy and presented a more difficult target against the AAA."[40]

But accuracy suffered from the high release altitudes. During Rolling Thunder, Seventh Air Force compensated by sending large attack formations to hit each target. After Rolling Thunder, American air forces began to draw down and the smaller forces available during Commando Hunt mandated attack formations of only two to four aircraft. Maj Charles Neel observed hundreds of attacks along the Ho Chi Minh Trail as a Misty FAC, and did not think small pinpoint attacks with iron bombs by small formations were viable, particularly against dug-in antiaircraft guns. "During that period of time, using strictly slick bombs, our chances of knocking out a gun were infinitesimally low."[41] F-4 pilot (and the USAF's only fighter pilot ace of the war), Steve Ritchie considered high altitude iron bomb attacks on small targets like trucks or antiaircraft sites "a waste" because "it's almost impossible to hit a target of that small a size from the delivery altitudes required in a combat situation, not knowing the exact terrain elevation, not knowing the exact wind, [and] having to deliver from 7,000 foot delivery altitudes in order to

---

[40] Lt Gen Lawrence E. Boese, interview by Douglas McDonald, March 28, 2004, 4, Adams Center, Virginia Military Institute.

[41] Maj Charles Neel, interview by Jerry Cantrell, December 2, 1971, 12, Air Force Historical Research Agency, Maxwell AFB, AL.

recover out of the heavy AAA fire. Therefore, when we talk about trying to kill guns or kill individual trucks with a weapon system like the F-4, I think we're blowing smoke."[42]

Accuracy suffered even further due to rock-bottom experience levels within the fighter force in theater. Most of the Air Force's "old breed" of career fighter pilots served combat tours during Rolling Thunder and were not required to return because the one-tour policy mandated all flyers serve in Southeast Asia before any were required to return to combat. While attending Air War College in 1970, a former F-4 squadron commander sensed the problem by the last year of Rolling Thunder, and wrote "by 1967 most of the highly skilled aircrews who had spent a majority of their air force careers in tactical fighters, crews with as much as 2,000 hours of tactical jet fighter time had either (1) completed their SEA tour, (2) were imprisoned by the North Vietnamese, or (3) were dead."[43] According to a study by Air Force historians, by 1969, the Air Force was scraping the bottom of the barrel because half of all pilots, lieutenant colonel and below, had already completed Southeast Asia combat tours and could not be sent back without volunteering, prompting the Air Force Chief of Staff to call for "austere management actions…to delay as long as possible involuntary second SEA tours."[44] The Air Force fleshed out fighter ranks with even more pilots retrained into fighters from the Air Force's other commands (called "retreads" for the practice where a used tire is remanufactured with a new tread), and an increased flow of new pilots from UPT.

Pilots trained in new aircraft faced a range of cultural and technical challenges to re-orient their previous flying experience towards the demands of flying a fighter. As noted, pilots

---

[42] Capt Richard S. Ritchie, interview by Hugh N. Ahmann, October 11, 1972, 91-92, Air Force Historical Research Agency, Maxwell AFB, AL.

[43] Col James McGuire, "Accurate Bombing: What if it Were True?" (Air War College, Maxwell AFB, AL, 1970), 2.

[44] Little and Spink, "USAF Personnel Rotation in Southeast Asia (A Chronology) 1961 through 1968," 28.

retrained as FACs faced relatively few technical problems due to the aircraft's simplicity. For the men switching into fighters, pilots from Air Defense Command's interceptor squadrons and Air Training Command were familiar with high performance jets and normally transitioned without difficulty. Hoyt Vandenberg Jr. assessed former Air Training Command (ATC) instructors as good leaders, but observed they needed fighter experience to become proficient bombers. "These ATC guys were effective, particularly as flight commanders. They were good leaders; they were good officers, but they didn't get the same bomb results." Vandenberg singled out bombing skills because "the name of the game is to get the ordnance on the target." He believed Air Training Command pilots had potential to become good fighter pilots, because "the longer they stood with it, the better off they would be."[45] G.I. Basel went through F-105 training in 1968 with an Air Defense Command (ADC) pilot. Although Basel opined that his classmate "was from another part of the military world," he warmed up to him because of his willingness and ability to compete with the others in their class. "He won our respect and admiration by quickly adapting to fighters and giving us a run for our money"[46]

Heavy multi-engine pilots had a more difficult task succeeding in fighters because of different flight characteristics and mission demands. The physics of fighter flight presented the first challenge: fighter speeds were much faster than those typical of multi-engine aircraft. Fighters often operated in the 450-600 knot range—about 150 to 200 knots faster than large aircraft operating speeds. These speeds affected the pace of flight operations—the tempo of a fighter sortie was much higher and high speeds required more anticipation to stay ahead of the aircraft and the mission. The major events in a fighter sortie came much faster as well. B-52

---

[45] Maj Gen Hoyt S. Vandenberg, interview by Lt Col James D. Weidamam, December 19, 1985, 123, Air Force Historical Research Agency, Maxwell AFB, AL.

[46] Basel, *Pak Six*, 6.

pilots had about four hours from takeoff from Guam before their air-refueling. Fighters from Korat and Takhli had twenty to thirty minutes from takeoff to their air refueling join-up. A fighter's small wings delivered high speeds and tight turns, but required a sensitive feel to derive maximum performance without stalling out or going out of control. Commando Hunt's workhorse, the F-4, had a very nasty tendency to go out of control if the pilot moved the control stick laterally at low airspeeds. Robin Olds described the experience during his F-4 checkout: "I said I wanted to experience adverse yaw. Up we went." In a steep climb, Olds' airspeed dropped to barely 150 knots, at which point his rear-seat instructor said "touch the ailerons," which Olds did by moving the control stick to the side. Olds recalled "the bird went ape shit. Dirt and pencil stubs were on the canopy over my head" from the violent forces unleashed. "The bird was in a true tumble."[47] Olds nearly had to eject, but regained control at the last moment. These intimidating characteristics took time and experience to master, arguably more time for a pilot accustomed to flying a large aircraft in non-maneuvering flight than an air defense or training command pilot accustomed to similar speeds and flight characteristics.

The fighter's cockpit workload was considerably higher and governed by different norms when compared to large multi-place aircraft. Aircraft with a crew of five or six had a much greater division of labor compared to the F-4's crew of two. The F-4's front seat pilot had to perform the duties of pilot, copilot, and flight engineer, while the back-seater performed the duties of navigator, radar-navigator, electronic warfare officer, and had the lookout duties of a tail gunner. At high speeds, there was little time to collaborate, and there was certainly no time to follow the formalized and scripted cockpit communications typical of a bomber flight deck. Likewise, fighter crews had to memorize their checklists, because there just wasn't enough time to follow the labored "read, accomplish, and verify" steps typical of SAC checklist usage. Fighter

---

[47] Robin Olds to Ratnet mailing list, April 17, 2007.

speeds, maneuverability, divisions of labor, and checklist procedures posed significant aviation challenges for multiengine pilots compared to those transitioning to a lower performance aircraft like a FAC or a gunship. Frederick Nyc, for example, was a multi-engine pilot and considered applying for fighters en route to Vietnam, but instead elected to pursue two rotations as an aggressive and successful Blind Bat C-130 FAC over the Ho Chi Minh Trail in an aircraft he could quickly master and be confident in. "Although I was presently flying single-engine jets, I had more than 2,500 hours of multi-engine time and I really didn't have the fighter pilot mentality. I just felt more comfortable in multi-engines."[48]

Several experienced fighter pilots cite instances of successful transitions into fighters among cross-trained retreads who displayed the degree of flying proficiency, competitiveness, and aggression they believed were needed to fly fighters. Many other fighter pilots, however, point out shortcomings of their cross-trained squadron-mates. After his retirement, James A. Young, former 8th TFW commander at Ubon, bluntly stated "we had no business, either by background or age, to try to take a 35-year-old pilot who had been flying in bombers and troop carrier airplanes for fifteen years, and never had any desire to begin with to be a fighter pilot" and then put him in a fighter cockpit. Young assessed many of these pilots were better suited to transports or FACs and recalled higher headquarters dissatisfaction when he predicted a cross-trainee was unlikely to meet the minimum performance level needed of a fighter pilot.[49]

---

[48] Nyc, *Blind Bat*, 12, 30.

[49] Young was likely referring to his command of the 562nd Tactical Fighter Squadron at McConnell AFB, KS—an F-105 training squadron, where he had to estimate whether a pilot would make it in a fighter. Maj Gen James A. Young, interview by Dr. James C. Hasdorff, September 24, 1985, 57, Air Force Historical Research Agency, Maxwell AFB, AL.

In addition to pulling harder on existing pilot cohorts, Air Training Command increased pilot production from a pre-war level of 1,675 pilots in 1964 to a peak of 4,032 pilots in 1972.[50] The resultant turnover pushed stateside fighter bases into a perpetual training mode which limited high-end tactics training. Tactical Air Command squadrons switched from combat-ready units to training units. The TAC commander, Gen Gabriel Disosway reoriented the command for long-term support of the war: "I got out of all the commitments to Strike Command, and I said, 'Hell, these units aren't available to you now. These are training units. The thing that is important now is getting the proper trained guy to Vietnam.'" Disosway singled out the challenge of getting retreads ready for Vietnam: "We started getting people from SAC and everybody else, you know, to run through the mill and send over there. They didn't even know how to make a steep turn, much less do anything else. So it was a hell of a problem" that would have been worse had Tactical Air Command not reconfigured for a training role.[51] Despite Gen Disosway's best efforts, most men new to fighters found the training insufficient to prepare them for combat. TAC's chief of fighter training assessed that in a hundred-hour flying course, "approximately two-thirds was spent learning 'how to fly' the fighter" and the training left for learning "how to employ the aircraft" was "spread extremely thin."[52] Lawrence Boese recalled "we were trained very poorly in the States. The missions that we flew were very basic missions, and I would call them non-demanding type missions. It always seems like the big emphasis was on safety—fly the missions and don't lose an aircraft."[53] A safety-first focus preserved resources, but precluded

---

[50] Capt John H. Kafer, "Relationship of Airline Pilot Demand and Air Force Pilot Retention" (Wright Patterson AFB, OH: Air Force Institute of Technology, 1988), 60.

[51] Gen Gabriel P. Disosway, interview by Lt Col John N. Dick, October 4, 1977, 103, Air Force Historical Research Agency, Maxwell AFB, AL.

[52] McGuire, "Accurate Bombing: What if it Were True?," 3.

[53] Boese, interview, 7.

opportunities to wring maximum performance from an aircraft (and occasionally put it out of control as related by Robin Olds) which built the confidence needed to fly in battle. A pilot afraid of his airplane would be unable to leash its utmost performance, giving up a significant advantage in combat. F-4 back-seater John Amos Parker was more blunt, calling the level of training he experienced within TAC's 49th TFW in 1969-70 as "dog shit."[54]

The assimilation of crews with poor or limited training dulled the performance levels of fighter squadrons in Southeast Asia. Capt Clark described the experience level in his unit in 1969 as "much, much lower now than it was when we were flying daily missions into Pack 6"[55] Less experienced crews were less likely to achieve satisfactory weapons results. Steve Ritchie assessed the F-4 "as accurate as any other airplane," but Ritchie believed "the pilot is the key. A good pilot in an F-4 can be just as accurate as a good pilot in any other airplane that we have right now."[56] Lawrence Boese observed "it takes you two to four years to be even a reasonable fighter pilot—and much longer to be a mission commander or instructor. So you take people who have never flown a fighter aircraft, give them six months of training, and expect them to perform as a seasoned veteran. It just doesn't work, not just [for] fighter aircraft, but [for] all types of aircraft."[57] Fortunately, new technologies deployed during Commando Hunt began to catch up to the aerodynamic and propulsion advances that pulled ahead of aircraft avionics in the late 1950s. Advances in precision weapons and avionics helped overcome some training deficiencies and

---

[54] Parker, interview, 59.

[55] Clark, interview, 7.

[56] Ritchie, interview, 87.

[57] To qualify his estimate, Lt Gen Boese retired with 29 years as a fighter pilot. Boese, interview, 7-8; "Biographies: Lieutenant General Lawrence E. Boese," accessed January 27, 2010, http://www.af.mil /information/bios/bio.asp?bioID=4722.

began to sway a correlation between doing the mission effectively and its risks in favor of increased mission effectiveness.

Technology and the Changing Face of War: "We Just Took that Bridge Down"

New technology, embodied in new aircraft, munitions, and navigation systems powerfully affected the interplay of mission and risk throughout Commando Hunt, which in turn eased motivational challenges and shifted the distribution of responsibilities from pilots to navigators within fighter cockpits. Newer aircraft types, including the F-4D and the F-4E entered the theater as older aircraft departed as part of the U.S. drawdown between 1969 and 1972. The F-105 and F-4C had carried the load in Rolling Thunder, but now the newer F-4D and F-4E featured new avionics that made these fighters more capable. In Thailand, the 388th TFW at Korat traded its F-105s for more modern and capable F-4s between 1968 and 1969, and the 355th at Takhli closed operations in 1971, returning its tattered but proud F-105s to the states. [58] Col Clarence Anderson commanded Takhli from 1970 to 1971 and he and his pilots took pride in their piloting skills at the controls of their Thuds as a new generation of aircraft with more automated systems like the F-4D and F-4E entered service. "One time I was leading a flight of two aircraft, we dropped our bombs, got some good secondaries, started some fires, and the controller finishes with 'Hey, Sierra Hotel, guys good job…*just like all the Thuds do*.'" Anderson's wingman remarked after the mission: "hey, colonel, did that make you feel good? What that guy said out there?' and once I gave it some thought, it sure as hell did." Anderson enjoyed leading his wing of Thud pilots, and took satisfaction achieving results with second-best

[58]In South Vietnam, Phu Cat traded its aged F-100s for F-4s in 1969, while the remaining three F-100 bases returned their fighters to the United States between 1970 and 1971. Correll, *The Air Force in the Vietnam War*, 10.

technology, while a less experienced fighter force struggled to effectively employ modernized versions of the F-4D and F-4E Phantom at other Southeast Asian bases.[59] The FAC's comments appealed to many of the values of Air Force aviators; he appealed to Anderson's desire to be the best and to win recognition from one's peers. The bombing comments would have been especially appreciated coming from a well-informed but impartial observer like a FAC.

The Air Force's renewed F-4 fleet in Southeast Asia employed a range of new and experimental weapons produced by the research and development communities back in the United States. Stanley Umstead, who would command these newly modernized forces at Korat Air Base in 1971-1972, was working on the Air Staff as a colonel in 1969 and oversaw the hectic push to field new weapons for Southeast Asia. "I recall having to maintain the card files for the Director of Operations to use for reference in briefings and things like this. It was almost physically and mentally an impossibility to keep track of all these programs and where each one stood at any one particular period of time." Umstead recounted "there were 30 to 40 different types of munitions that were being developed and ECM [electronic countermeasures] systems as well. There was really a tremendous amount of activity."[60] F-105 pilot William Ricks returned to Southeast Asia in the F-4 and was amazed at the developmental activity, likening combat to flying on a test range in the United States—safe, controlled, and an interesting flying challenge. "I went back for my second tour after I graduated from Fighter Weapons School in October of 1970 and I was there for a year at Ubon in the 8th Wing." At Ubon, Ricks recalled "we dropped a

---

[59] "Sierra Hotel" is the phonetic alphabet for S.H., or "shit hot" in fighter pilot vernacular, which is a term of enthusiastic positive appreciation. Clarence E. Anderson, *To Fly and Fight: Memoirs of a Triple Ace* (Pacifica, CA: Pacifica Military History, 1999), 282-283.

[60] Lt Gen Stanley M. Umstead, interview by Capt Mark C. Cleary, July 22, 1983, 63, Air Force Historical Research Agency, Maxwell AFB, AL.

lot of different kinds of bombs. We dropped laser-guided bombs. It was like Weapons Range East—a branch of the weapons development laboratory at Eglin AFB, Florida."[61]

New generations of cluster bombs introduced a jump in mission capability during Commando Hunt, signaling their evolution from an in-flight hazard to an effective weapon. Early cluster bombs used at the beginning of the war (such as Cluster Bomb Unit-2 or CBU-2) were difficult to employ and hazardous to the crew and aircraft. These systems dispensed scores of small baseball-sized bomblets out the back of tubes hung under the wings of strike aircraft. To get an optimal dispersal pattern and minimize scattering, crews had to release these weapons from very low altitude, exposing themselves to the danger of small arms fire. Early dispensers were inherently risky because they could allow bomblets to strike the aircraft or each other and explode. Robin Olds determined early bomblet detonations led to the loss of three of his wing's aircraft. "They have to be delivered very low, and quite rapidly, and they come down in tumbles. The next one hits it [the preceding bomblet] and 'pow' you've got a big explosion right alongside your fuselage. We lost three airplanes like this."[62]

Newer variants of cluster bombs were introduced to Commando Hunt in 1971 and made the weapon more effective, safer, and lower risk. Instead of seeding bomblets from treetop height, newer variants came in clamshell-like dispensers shaped like a bomb that could be dropped from high altitudes. The ability to kill the enemy at a lower risk to oneself reaped motivational dividends from technology. With the introduction of CBU-52, a sophisticated radar-fuse measured the weapon's height above the ground to determine when to break apart the canister and disperse the 217 two-pound bomblets. This provided a degree of safety to the crew by

---

[61] Ricks, interview, 7-9.

[62] Olds, interview, 16-17.

eliminating the chances of contact with the aircraft after release, and the radar-fuse enabled the crew to drop them from high altitude without scattering the bomblets. Because cluster bombs were area-weapons, they relaxed the need for precision because they covered a football-field sized pattern on the ground. After flying a tour in F-105s during Rolling Thunder, Ed Rasimus checked out in the F-4 and appreciated many of the technological improvements introduced between Rolling Thunder and Commando Hunt VII. He took great satisfaction dropping the new CBU-52s onto a SAM site in 1972, observing at first, "puffs of smoke over the missiles identify where the CBU cans have opened." Then "in a split second the area is covered with bomblets detonating like hundreds of flashbulbs at a presidential press conference." En route back to Korat, "one flight lead report[ed] that the column of smoke [from the CBU attack] was passing fourteen thousand feet." Rasimus reveled in the recognition of his peers: the simple congratulatory comment "Nice job, Eagles" was "the best paycheck we could ask for."[63]

Cluster bombs did have limitations since their hand-grenade-sized bomblets lacked the punch to kill hardened targets. Frequently used to attack antiaircraft sites in Laos, crews began to see CBU as a suppression weapon instead of a killing weapon because dug-in antiaircraft sites were hard to destroy. F-4 pilot Steve Ritchie recalled that he "personally witnessed guns [still] firing with CBUs going off all around the gun site." Because of the hardness of the guns and tenacity of the crews, "the average CBU would not kill a gun, [but] it would kill the crew if the crew was not protected."[64] Ed Cobleigh believed experienced crews used foxholes and dugouts close by for shelter from attack. In a night-time duel with guns over the Ho Chi Minh Trail,

---

[63] Interestingly, Rasimus used the flashbulb metaphor to describe an intense antiaircraft gun concentration the first time he was shot at over North Vietnam on a previous tour in Southeast Asia as a new lieutenant in the F-105. To be dispensing his own "flashbulbs" on North Vietnam's air defenders must have been particularly satisfying. Rasimus, *Palace Cobra*, 162; Rasimus, *When Thunder Rolled*, 81.

[64] Ritchie, interview, 92-3.

Cobleigh observed the guns go silent as he pulled his F-4 out from a CBU bomb run. "When a cluster bomb canister is explosively split, it signals its arrival with a single bright flash in the sky. The live gunners know this well, the ones that didn't are dead. The smart ones realize that in three or four seconds a shit storm of bomblets and flying fragments will blanket the area…the gunners, seeing the first canister's opening burst dove into their shelters to escape the incoming steel rain."[65] These new weapons enabled crews to deliver attacks from higher altitudes and still hit the target because they blanketed a large area. This change affected the balance between the mission and the risk of getting shot down if crews could attack accurately enough without diving through the heavy flak at low altitude. Aircraft improvements accompanied improved munitions, further tilting the balance between mission and risk during Commando Hunt.

To increase bombing accuracy and compensate for imprecise bombing parameters, the Air Force added a bombing computer to the F-4D, first deployed in 1967, and the F-4E deployed in 1968.[66] This computer reduced the necessity for flying an exact airspeed, angle, or height in a dive-bomb run and the requirement to apply manual corrections needed for successful manual dive-bombing. Instead of flying to an exact point in the sky at a precise height, angle and airspeed, the F-4's computer used the radar (locked on by the back-seater) to calculate the aircraft's height and angle, and instantly computed an exact release point for the weapon. Simplifying the task for the pilot, the bombing computer allowed the pilot to simply aim his sight at the target, depress the pickle button and then fly over the target (with the pickle button still depressed) to allow the computer to release the bomb at the appropriate moment. This system actually allowed the pilot

---

[65] Cobleigh, *War For the Hell of It*, 70.

[66] The F-4D and F-4E were optimized for Air Force missions and represented a big step forward in capability compared to the earlier F-4C that was much closer to the Navy's fleet defense fighter, the F-4B. Momyer, *Airpower in Three Wars*, 176.

to begin pulling out before weapons release and toss the bomb onto the target from an even greater standoff range (this system was commonly referred to as "dive toss"). But the system faced a cultural hurdle with some pilots. Brand new pilots used dive toss more enthusiastically than some older more experienced fighter pilots who had made their reputations by manual bombing without a computer. Ed Rasimus quipped initially he had "dropped lots of iron over North Vietnam and knew positively that dive toss was not the match of my weapons delivery skills. It might work for some of those new punks in the squadron and some of those minimal-skills retreads from bombers and airlift, but it wasn't necessary for me and I wouldn't bother with it."[67]

Rasimus' back-seater, Dee Lewis, a navigator, convinced him to try it once on his first combat sortie, and the test won Rasimus over. On his first pass Rasimus assessed his run as high, shallow and slow (i.e. "lousy"), but his bombs hit exactly on target. Due to the F-4's radar and computer, "the bombs aren't short, they aren't blown by the wind, they're on target. It's like magic!"[68] It was appropriate that Lewis—a navigator—convinced Rasimus to adopt dive toss bombing, because an effective dive toss attack fully engaged the talents of both crewmembers. The pilot aimed the sight at the target and flew smoothly over it, while the back-seater locked the radar onto the ground to provide the drop calculations. Lewis earned his front-seater's respect and with it his pilot's willingness to surrender some of his agency in the bombing process—one that had been previously determined solely by front seat skills. Precise flying skills, the byproduct of talent and experience, became less important in this new shared experience to accurately put bombs on target as a team, now mandated by the growing sophistication of aircraft systems.

---

[67] Rasimus, *Palace Cobra*, 47-48.

[68] Lewis was an instructor weapons systems officer, or "IWSO." Ibid., 55.

Navigators trained to operate the F-4's back seat systems entered the force in large numbers in 1969 to free-up pilots as the Air Force scrambled to fill cockpits and satisfy the one tour policy. An Air Force study conducted in 1967 and 1968 compared the relative performance of pilots and navigators in the F-4 rear cockpit. The study found that after thirty sorties, there was "no general superiority in performance" between either group, validating the move to use navigators in F-4s.[69] Many navigator trainees were eager to get into fighters, which featured an exciting mission, and a dual set of aircraft controls. William Beekman wanted to go to pilot training, but was unable because of his eyesight, "so I wound up going to nav school, and I graduated in the top 10 percent." Due to his high class standing, Beekman was able to choose between specialized "follow-on schools, which would be either navigator/bombardier school or electronic warfare school and then specialize in those areas, or a varied number of aircraft." Beekman chose fighters, as many others in the top ranks at navigator training. "The top [aircraft], of course, especially that the Academy grads jumped at, were F-4s."[70]

Fighter navigators, called weapons system officers (WSOs—pronounced "wizzos"), became the squadron's technical experts, specializing in the aircraft's inertial navigation, radar warning, electronic countermeasures, weapons, and radar. Dive toss accuracy became a shared responsibility between the pilot's flying and the WSO's tweaking and operation of the aircraft's radar and fire control systems. Rasimus noted the wing at Korat was committed to dive toss "more than any in the world" and "had worked hard to optimize the dive toss system. Every aircraft had every drop plotted to determine trends, and then every parameter tweaked and refined

---

[69] Shore et al., *Proficiency Differences of Pilot and Navigator F-4 Second-Seat Crewmembers: A Southeast Asia Evaluation*, 1, 10-11.

[70] Beekman, interview, 9.

to improve accuracy."[71] Without this kind of technical commitment and dedication from a unit's operators and maintainers, the dive toss system could perform very poorly. Charles Neel acted as a FAC for the earliest F-4D dive toss deliveries in 1967 and observed "although they carried a lot of fire power, they'd scatter [bombs] all over the place….There were obviously some malfunctions in the case when the F-4D's started operating with their toss bombing system. I've actually had misses of an intended target of as much as 700 to 1,000 meters using this system. I have to assume that that was a malfunction of the system. But generally speaking, the bombing accuracy was abominable."[72] Steve Ritchie assessed "the dive toss in the D model and the E model, when working properly, is a very accurate system." But he qualified his observation: "if the dive toss in the F-4 could be kept peaked and crews understood it and operated it properly, it was more accurate than [standard] visual bombing."[73] WSOs had a special incentive to keep the dive toss system tweaked because it made their contributions more essential to the mission—just like C-130 and B-52 navigators, fighter WSOs were motivated when they applied their unique skills and training to an essential element of mission accomplishment. The family of other weapons introduced during Commando Hunt made WSO contributions to the mission even more important.

As the Air Force fighter community operated greater numbers of F-4s, a different team mentality gradually displaced the single-seat, single-engine ethos that characterized fighter culture before Vietnam. Unlike the F-4C, F-105, and F-100, that featured relatively simple avionics and relied on pilot skills, the F-4D, F-4E and a family of new weapons demanded a

---

[71] Rasimus, *Palace Cobra*, 47.

[72] Neel, interview, 40-41.

[73] Ritchie, interview, 88.

deeper understanding of complex fire control systems and painstaking optimization of those systems. This requirement began to shift the role of fighter pilot from a singular and heroic figure to an increasing role as systems manager and crew leader. James Young, the 8th TFW commander was a single-seat partisan, but saw the necessity for well-trained WSOs in his F-4s because of the increasingly sophisticated and important technology run from the back seat. "He really had a job to do. Up until then he had nothing to do.…But with all this sophisticated equipment, most of which operated directly or indirectly through the backseat, he was a busy little fellow, and they did good work."[74] The widespread introduction of navigators into the fighter force provided a far more harmonious division of labor with the pilot at the aircraft controls and the navigator as the indispensible technical expert when contrasted to two pilots, each desiring control.

Despite their growing contributions in the air, navigators fought a slow uphill battle to gain acceptance within their squadrons and wings. There was a steady backdrop of teasing and criticism between pilots and navigators within fighter squadrons. Bob Ross described the navigator's plight: "It is an understatement to say that navigators were treated like dirt in the average Vietnam fighter wing during this era. As a group, fighter pilots ridiculed them as an endless string of navigator jokes made the rounds." The navigators gave back as well as they got, but faced an institutional obstacle because "by regulation they could hold no command position within either the squadrons or the wing." Facing a shortage of experienced fighter pilots, Ross approached his wing commander with a proposal to place two senior navigators into critical wing staff positions. Ross thought his commander's "first inclination was to toss me out of the office, but he sat silently and pondered the alternatives, for he was well aware of the critical [pilot] manning situation." With the reply, "All right, Bob, let's give them a shot. We sure as hell don't

---

[74] Young, interview, 74.

have any pilots to spare," the two navigators moved into key wing staff roles where they proved themselves highly competent officers and leaders.[75]

As WSOs replaced young pilots in the Phantom's back seat, front-seat cockpits opened up to fresh graduates out of pilot training and by 1969, the F-4 had become the "hot fighter" to qualify in.[76] James Kula, a 1969 Air Force Academy graduate was one of the first pilots able to compete for an assignment direct from UPT into the front seat of the F-4, which attracted the best pilots in his class. "The attitude was, try to finish in the top so you could get one of the four or five fighters that would come down to your class of, say, 60 [student pilots]."[77] Previous pilot cohorts had been seasoned in the F-4's rear cockpit. Younger, far less experienced fighter pilots (like Kula) in F-4 front seats mandated greater technical skills and airmanship from their WSO partners. F-4 squadrons paired their most experienced WSOs with new pilots to get them experience quicker. The best WSOs qualified as instructors (or IWSOs) which helped expand and professionalize the new and growing WSO community. Now responsible for seasoning inexperienced front-seaters, WSOs had to become proficient and demonstrate good situational awareness of both front and back seat responsibilities. Training went both ways. Pilots helped new WSOs become proficient in formation flying, recovery from unusual attitudes, and approaches to landing. Upton Officer believed "without this training that we constantly gave them, we would probably have lost [an] airplane and possibly one or both of the aircrews" in two cases

---

[75] Bob Ross, *The Warriors: Reflections of a Fighter Pilot, Test Pilot, and Veteran of the Air Wars Over Vietnam* (Las Cruces, NM: Yucca Tree Press, 2002), 218-220.

[76] John P. Cerak, interview by Dr James C. Hasdorff, June 11, 1991, 8, Air Force Historical Research Agency, Maxwell AFB, AL.

[77] Col James D. Kula, interview by Dr. James C. Hasdorff, August 30, 1991, 7, Air Force Historical Research Agency, Maxwell AFB, AL.

where the pilot was incapacitated[78]. Many WSOs sought UPT slots as they entered the Air Force, but were denied for various reasons (most often eyesight) and went to UNT. Hoping for another shot at UPT, many young WSOs asked to share time on the controls with their front-seaters so they might compete better in applying for pilot training. When afforded the opportunity, many WSOs seized opportunities to become Air Force pilots. Of the six oral histories by WSOs who were shot down and became prisoners of war in Hanoi, all were offered any assignment upon their repatriation in 1973. Five of six requested UPT, and the sixth was unable because his injuries grounded him permanently.[79]

Guiding Bombs: "You Could Knock Out Anything"

WSOs played an increasingly important role in conventional weapons delivery with systems like the dive toss. They played an even greater role with the introduction of a new generation of guided weapons as Commando Hunt began. This new generation of guided weapons, in which F-4 WSOs played an essential role, had a substantial impact on the relationship between the mission and risk, powerfully affecting perceptions of combat. Navigator Charles Jackson clamored for an assignment to a squadron equipped with precision guided bombs because of the WSO's essential role in dropping them. "I wanted to be in the 433rd because that was a smart bomb outfit. I figured if I was going to drop bombs, I couldn't figure anything better for a backseater." From the F-4's back seat, Jacskon would lock on and steer the new generation

---

[78] Maj Upton D. Officer, interview by Lt Col Lyn R. Officer, July 11, 1973, 104, Air Force Historical Research Agency, Maxwell AFB, AL.

[79] Disosway, interview; Beekman, interview; Richard Lyman Bates, interview by Vera Clayburn, May 28, 2005, Veterans History Project. Library of Congress; Capt Charles A. Jackson, interview by Dr. James C. Hasdorff, June 6, 1991, Air Force Historical Research Agency, Maxwell AFB, AL; Marshall, interview; William J., Lt. Col. Reich, interview by Dr. James C. Hasdorff, July 30, 1991, Air Force Historical Research Agency, Maxwell AFB, AL.

of guided weapons coming into the theater. "If I was going to be a backseater, I wanted to be a backseater with a job using smart bombs, laser bombs, EGOBs—electrical-guided optical bombs—and any munitions we could couple with the EGOB guidance, or the laser guidance."[80] Jackson expressed a high level of commitment to the precision attack mission, which as a navigator, afforded him an opportunity to exercise a degree of control over the bombing mission and to test his skills in accurately delivering a guided bomb.

Rolling Thunder's earliest guided weapons, designed for single-seat fighters, had significant drawbacks which limited their utility and delivered unsatisfactory results. These early weapons, like the AGM-12 Bullpup, were so difficult to use they exposed the pilots to the same or even greater dangers than unguided bombs. Robinson Risner's F-105 pilots used the AGM-12 Bullpup missile in some of their earliest attacks on North Vietnam in 1965, but the missile's small 200-pound warhead and tricky guidance diminished its effectiveness and increased the risk to the launching pilot. Lt Col Risner led a strike against North Vietnam's Than Hoa bridge on April 3, 1965 and was disappointed by the missile's small warhead. Although Risner and his pilots demonstrated remarkable valor and airmanship in achieving multiple Bullpup hits on the massive steel bridge, he stated "I watched them bounce off that bridge like popcorn. I am sure they didn't even burn it. They didn't make an impact." Risner's missile lacked the punch to knock down the bridge, but he attacked again with a second missile, which illuminated the dangerous threat exposure its use mandated: "when I came around and fired the first one, the antiaircraft fire was heavy. The second time around, I rolled in at about 20,000 feet. I was supersonic when I fired the second one. They hit me with either 23 or 37 millimeter at 1.5 Mach."[81]

---

[80] Jackson, interview, 7.

[81] Risner nursed his aircraft into Danang AB, Vietnam for repairs before returning to Thailand. Risner, interview, 100.

Achieving a Bullpup hit was an act of extraordinary airmanship for a single-seat F-105 pilot. When firing a Bullpup, the launching pilot fired the missile towards the target, tracked it by watching a flare in the tail of the missile, and then used a small joystick mounted over the throttle to fly the missile into the target—in effect, he flew the plane with his right hand and simultaneously flew the missile with his left—a task requiring considerable piloting skill. William Jones, an F-105 pilot, thought firing and flying the Bullpup into a target was an interesting flying challenge in peacetime, but became an impractical task in actual combat. "We had a little controller that fit down in a little tube in the left brake pedal well and we'd take that controller out, put it on the throttle quadrant on the left side and then fire the missile and you could actually guide it from the cockpit until it hit the ground. After a while I got pretty good at that. You could pinpoint a target. Of course, the problem with that was you had to guide it all the way until it the hit the ground so you're not able to do a whole lot with your airplane while you're guiding this missile."[82]

John J. Burns, 8th TFW's Vice Commander highlighted the critical vulnerability of pilots operating the Bullpup. Before the war, the missile's civilian advocates in the Pentagon "thought that was a great thing because they were going to have a guided weapon. It turned out—and we really didn't anticipate this—to be a very, very vulnerable delivery system." To use the missile, "for 20 or 30 seconds, you are flying straight and almost level at relatively low altitudes, maybe fast but not too fast, very vulnerable." When Burns was at Nellis AFB, he met the Air Force's expert on Bullpups. "The poor guy that introduced the Bullpup…was using it, got shot down, and had some very bad fractures of the leg. He was picked up and went back to Nellis. When I was

---

[82] Brig Gen William C. Jones, interview by Jonathan T. Schmidt, February 25, 2007, 6, Adams Center, Virginia Military Institute.

over there in 1968, he came back over again with the Bullpup II which was the extended range Bullpup, and on the first evaluation mission, the poor guy got shot down again."[83] With such exposure to threats, early guided weapons (once they were understood) imposed the same motivational challenges experienced by bomb-droppers because they exposed pilots to the same threats without much improvement in effectiveness. But the unsatisfactory Bullpup spawned a second generation of guided weapons that began to change the correlation between mission and risk through increased lethality and accuracy, and then through decreased exposure to threats.

The AGM-62 Walleye electro-optical guided bomb (EOGB) was the first of a new generation of guided weapons introduced late in Rolling Thunder and used widely in Commando Hunt. It was a small step ahead of the Bullpup, but its limitations did not bring much change. The Walleye, launched from the two-seat F-4 Phantom, corrected some of the Bullpup's shortcomings with a large 829-pound warhead and a "fire-and-forget" guidance system that allowed the crew to launch the bomb and then leave the area.[84] The Walleye had fins to give it an extended gliding range and a television camera in the nose that the back-seater could lock onto a high-contrast target before launch. Tested in an initial series of successful drops on North Vietnamese bridges in 1967, the weapon proved an effective killer. During the bomb's initial testing, however, several limitations became apparent to its crews. It proved finicky in combat because early TV systems needed a lot of contrast to achieve and hold a lock-on. The bomb also put the crew at risk in high-threat areas despite the fire-and-forget capability because of the long straight attack run required to achieve a lock on. John Burns was part of the initial combat testing of the Walleye and used it with great success in a lightly defended area in the buffer zone near China in 1967. "I

---

[83] Burns, interview, 304-5.

[84] Porter, *Second Generation Weaponry in SEA*, 3.

thought it was very useful—and again it was surprising how you would get different perceptions." Although many knocked the Walleye, Burns became an advocate because of his success in the Chinese buffer zone. "Instead of forcing its use right downtown Hanoi where there were very limited targets for it and extremely difficult to operate, there were a lot of good bridges on that China border.…Those were very gratifying missions. The MiG missions and the Walleye missions were the missions that gave me the greatest sense of having participated in something meaningful. We went up there on a beautiful day, and they had a triple span suspension bridge, a beautiful bridge…[and] we just took that bridge down."[85]

The Walleye's improved precision opened targets to Rolling Thunder crews in Hanoi with the potential for lower collateral damage, but Burns' commander, Col Robin Olds was not a fan of the Walleye because of the vulnerability it posed to the launch crew in defended airspace. "I had begged people not to employ the Walleye in the near vicinity of Hanoi, in the middle of that ring. It takes 25, 30, 35 seconds to line up, to lock on and to release. And all the time you're doing this, your utmost attention and concentration is focused inside that cockpit and you're going perfectly straight and level at sort of a fixed angle, a dive, speed, and everything, you know."[86] Despite Old's protestation, Seventh Air Force sent two 8th Wing F-4s against Hanoi on January 18, 1968 with Walleyes and both were shot down. Wayne Ogden Smith was one of the two rear-seat F-4 pilots. "There was a tricky part about that weapon, although under certain circumstances, it was a good stand-off weapon." To Smith, "the disadvantage and the tricky part, if you had to lock onto a building inside of a city of a million people or so," you "put yourself in a vulnerable situation." Smith recounted that a successful Walleye launch mandated a slow,

---

[85] Burns, interview, 250-251.

[86] Olds, interview, 43.

shallow, non-maneuvering run in to lock on the bomb. "So you couldn't jink the airplane." On his ill-fated mission over Hanoi, "the weather opened up; we found the target and started down the chute, and I got hit at 11,000 feet….They bagged two of us during the mission."[87] The weapon's high cost ($31,500-39,500) and vulnerable approach limited its employment to occasional missions against high contrast targets, especially caves in Laos during Commando Hunt.[88] Seventh Air Force crews, for example, launched two Walleyes (presumably against caves housing the antiaircraft guns) during the second day of the battle to rescue Boxer 22 on December 6, 1969.[89] Although it was an effective killer against the right targets, the Walleye exposed its launch crew to considerable risk in defended airspace and did not significantly alter the relationship between mission and risk.

Skeptical about the next new development, Robin Olds voiced a similar concern about the potential risks of a nascent laser guided bomb capability under development during the last months of his command of the 8th TFW at Ubon.[90] "I would ask serious consideration of this problem when we talk in terms of laser target illumination…because it's the same principle [as the Walleye]. Some poor SOB is going to have to sit up there and circle and illuminate this target and I know people won't believe this, but I tell you he's dead, he's dead."[91] But Olds

---

[87] This mission launched just a few weeks after Robin Olds relinquished command of the 8th Wing and returned to the United States as Commandant of the Air Force Academy. Smith, a 1965 Air Force Academy graduate, was captured on this mission and spent five years as a prisoner of war. Smith, interview, 14-15.

[88] Porter, *Second Generation Weaponry in SEA*, 2, 17.

[89] Schlight, *Rescue at Ban Phanop*, 17.

[90] Air Force Systems Command and Tactical Air Command formed a joint group team to develop the first laser guided bombs in August 1967. Olds returned to the United States in December 1967. Porter, *Second Generation Weaponry in SEA*, 18; "Biographies: Brigadier General Robin Olds," accessed January 29, 2010, http://www.af.mil/information/bios/bio.asp?bioID=6651.

[91] Olds, interview, 44.

miscalculated the technological leap, and the laser guided bomb proved to be a winner that significantly altered the proportional relationship between mission and risk. By May 1968, five months after Olds returned to the United States, the Air Force initiated a highly-successful combat trial of the Paveway I laser guided bomb system at Ubon, which cleared the system for use in Laos and Route Pack One in North Vietnam that August.[92] As the new weapons became available in 1969, F-4 crews made increasing use of these new weapons, dropping 1,601 throughout the year. [93]

The first generation of laser guided bombs mated a laser seeker and guidance kit with a two thousand pound Mk-84 conventional bomb. One F-4 dropped the bomb into a funnel shaped "basket" in the sky about a mile across that allowed the bomb to lock onto a laser light shining on the target at the end of the funnel. Another aircraft, normally an F-4 circled above the target in a left hand turn as the back seater used an optical sight mounted on the left canopy rail to point a laser beam at the target. F-4 pilot Ed Cobleigh operated the system from the back seat in its initial combat trials and used a small joystick to move the laser, as he sighted through a 4x optical sight and crosshairs that looked "just like a telescopic rifle sight."[94] The laser-equipped F-4 needed to maintain a very smooth turn to allow the back-seater to manually keep the sight on target. Upton Officer dropped laser guided bombs on his third combat tour in Southeast Asia and recalled flying between 6,000 and 10,000 feet to designate the target (which made the designator aircraft

---

[92] Note that these areas were permissive environments compared to Route Pack Six and other heavily defended portions of North Vietnam. Porter, *Second Generation Weaponry in SEA*, 21.

[93] Ibid., 34.

[94] As already noted, Cobleigh found it "extremely difficult to hit a small target with a dumb bomb" with an F-4, but the laser-guided bomb was very different, enabling accurate hits from higher altitudes. Cobleigh, *War For the Hell of It*, 195, 203.

very vulnerable), but others including Cobleigh describe designating the target from 12,000 to 15,000 feet and higher, well out of the effective range of most antiaircraft guns.[95]

Ray Janes controlled an early laser-guided bomb mission over the Ho Chi Minh Trail south of Mu Ghia Pass in 1969. When he reported a bulldozer along the Trail, controllers on Hillsboro told him "We're sending you a special flight. Your orders are you do what they tell you and nothing else." Janes identified the target for a pair of F-4s, but unaware of the new laser capability, he was baffled by their behavior. "They found it and said; 'Okay we've got it. You don't do anything. Just move off to the side and watch. We're going to put on a show for you'…So I flew off to the side and they just flew around in circles. No radio talking or nothing. Round and around." Once they were in position, "this two thousand bomb came off of the airplane and went down there and there was this gigantic explosion. Lots of smoke and dust and it cleared away. There wasn't a recognizable piece of the bulldozer left." The fighters asked the astounded Janes for a bomb-damage assessment, who replied: "you either totally destroyed that bulldozer or it was a fake or it's completely covered up with dirt. I have no idea but there ain't nothing there so we'll mark it totally destroyed." Janes became an instant believer and said "I'll take any more of those bombs I can get."[96]

The Paveways generated substantial enthusiasm amongst the crews and headquarters because 60.9 percent of those dropped in 1969 scored direct hits on their intended aim points and the remainder hit an average of only nine and a half feet from their intended aim point.[97] This

---

[95] Officer, interview, 204; Patrick J. Breitling, *Guided Bomb Operations in SEA: The Weather Dimension, 1 February - 31 December 1972*, CHECO Contemporary Historical Evaluation of Combat Operations, October 1, 1973, 16-17, Air Force Historical Research Agency, Maxwell AFB, AL; Cobleigh, *War For the Hell of It*, 202.

[96] Janes, interview, 131.

[97] Discounting gross errors, those that missed averaged a miss distance of only 9.55 feet—"well within the lethal radius of the [2,000 pound] MK-84 bomb." Porter, *Second Generation Weaponry in SEA*, 34.

phenomenal accuracy, coupled with a massive two thousand pound bomb made for a lethal combination. Tim Ayres flew an F-4 in Commando Hunt after a tour as a FAC in the O-2 and sensed the power of the Paveway. "It was very accurate, very accurate. You could hit right in the hole of a gun emplacement; you could knock out a bridge; you could knock out a dam; you could knock out anything."[98] Ken Negus, an AC-130 gunship pilot, worked with laser guided bomb equipped fighters over Laos and observed "the weapons, I thought, were really good. They're very effective. The laser was unbelievable. Boy, that's just like "B.C." in the comic strip when the anteater goes 'zot' you know. That's all there is for that truck."[99] Although official references call the earliest cockpit-mounted laser designation system "White Lightning," its crews commonly referred to it as the "zot," which was the sound made by an anteater as it flicked out its tongue to eliminate an ant in Johnny Hart's popular comic strip "B.C."[100] Like the strip's all-powerful anteater, aircrews now had the ability to instantly vaporize a tiny powerless target at long range with a tongue of laser light. F-4 pilot Ed Cobleigh recalled years later that "from the backseat, using Paveway is like being God. I point at a target and lightning strikes it."[101]

Paveway changed the experience of aerial combat because it brought the killing in war close to many aircrews who might not have otherwise considered their deadly business from close range. Since Seventh Air Force crews waged Commando Hunt from high altitude against an elusive enemy, crews seldom saw the effects of their strikes except for an occasional secondary

---

[98] Ayres, interview, 40.

[99] Col Kenneth D. Negus, interview by Maj Lyn R. Officer and Hugh N. Ahmann, December 15, 1972, 116, Air Force Historical Research Agency, Maxwell AFB, AL.

[100] Breitling, *Guided Bomb Operations in SEA: The Weather Dimension, 1 February - 31 December 1972*, 1.

[101] Cobleigh, *War For the Hell of It*, 206.

explosion. The zot and its successor, Pave Knife provided a telescopic close-up of the target area, illuminating the lethal effects of aerial combat for the back-seaters. Like the FACs, who flew close to the enemy and saw the effects of their actions from very close range, laser designators made the crew more aware of the human enemy below. Some aviators expressed no second thoughts about their destructive tasks. When asked if he had nightmares, F-4 WSO John Parker replied "Oh God, yes…. I wake up in the middle of the night and I dream that I'm in South Vietnam and I've got wall to wall CBUs…we have 150 Viet Cong out in an open field, just an ideal target, and I miss. And that's the way I feel. I'm sorry. Those are vicious, vicious people."[102]

Other aviators took time to reflect on their business and had to reconcile their actions in war with their morality, and to reconcile within themselves the necessity to kill the enemy. Because the fast paced and demanding nature of air combat yielded no time to reflect on the meaning of one's actions as they occurred, this reflection and reconciliation normally took place at a quiet time after the mission. Two tour F-4 pilot Richard Hamilton stated when you fly "you have to disassociate yourself a certain amount about feelings…otherwise you'd go nuts trying to think of all…you might do."[103] Like the FACs flying in support of U.S. soldiers over South Vietnam, many of Commando Hunt's F-4 crews found justification for killing the enemy in preserving the lives of their friends and comrades. Ed Cobleigh's first look through the early Paveway's 4x optical scope gave him an unprecedented view of a thirty-seven millimeter antiaircraft gun battery entrenched in a Laotian clearing. "As we circle, I marvel at the view. I have never seen antiaircraft gun emplacements this clearly. Whenever I have flown low enough

---

[102] Parker, interview, 57.

[103] Hamilton, interview, 65-66.

to see them with the naked eye, I have been too busy dodging and weaving to look."[104] This proximity to the war led to a late-night reflection and reconciliation. "Late at night when no one is around but me, I ask myself moral questions about bombing civilian installations. I take no pleasure in trashing a town. In moments of weakness, I feel some pity for ground troops caught under my falling bombs; that fight is so one-sided. But killing antiaircraft gunners is somehow different. I have lost friends, squadron-mates, acquaintances, and fellow airmen to guns. It is gratifying to return the favor."[105] F-4 navigator Charles Jackson carried laser guided bombs to North Vietnam in 1972 and saw the results of his trade in a more advanced laser scope (called Pave Knife) projected inside his rear cockpit. "The only time I felt bad about a mission was when we were taking out bridges north of Hanoi." He observed in his scope "a little guy riding a bicycle, and 2000 pounds of high explosives just superimposed itself on his head! That bothered me for about a day and a half because that was the first time I saw a bomb that I dropped actually kill somebody other than exploding, or killing a target."[106]

Like Cobleigh and other warriors, Jackson had to come to terms with his profession, which had become much more than just skillfully operating a powerful flying machine, because he could see clearly the human costs of his actions through the screen of his laser pod. Technology had confronted Jackson with the deadly nature of his chosen profession. "I just had to rationalize the fact—that's war. No matter how much you want to kill the enemy, there's also other people who are going to be out there, other collateral damage, but the mission is going to have to come first." Like many other aviators, Jackson found justification in a "you or me"

---

[104] Cobleigh, *War For the Hell of It*, 203.

[105] Ibid., 206.

[106] Jackson, interview, 8.

construct: "I wasn't going to go back there and risk my life again even if there was a way I could avoid killing this guy. That would put too many other people in danger."[107] Jackson could view his actions as not just saving his own skin, he was avoiding putting chaff aircraft, Wild Weasels, and air-to-air escorts in harm's way as well. He could extend his "you or me" rationalization to "you or us" and justify killing to save the lives of his fellow aviators—a universally accepted value system in Southeast Asia.

Cobleigh, Jackson, and their peers enjoyed the ability to carry out effective attacks at higher altitudes and lower risk which lessened the motivational challenges by making it possible to attack at lower risk. Cobleigh recalled his mission against the Laotian guns took place above the gunner's maximum effective altitude. "The higher the better….we can fly with impunity above the guns defending the target."[108] Although the designator aircraft flew a predictable and steady circle around the target to designate the target, it proved safer than the alternatives in Laos during Commando Hunt.[109] Lawrence Boese saw laser guided bombing as more effective and less risky than conventional dive-bombing at 7,500 feet. "It was also much safer because the laser guided aircraft could deliver at much higher and safer altitude. I mean, they would release the LGBs [laser guided bombs] in the stratosphere, then be guided into the target and it would be destroyed. So it was not only much more effective but it was a whole lot safer." As a result, laser-guided bombs "became the weapons of choice."[110]

---

[107] Pave Knife was a pod mounted on the wing that had a gimbaled and stabilized laser sight projected into the rear cockpit. This improvement allowed the crew to maneuver the aircraft as they designated a target. Pave Knife-equipped F-4s were more survivable in high-threat areas than zot-equipped aircraft. Ibid.

[108] Cobleigh, *War For the Hell of It*, 200.

[109] The early "Zot" designators mounted in the rear cockpit were supplanted by the more capable "Pave Knife" designator in 1972, which allowed the designator aircraft to maneuver while designating a target because it had a gimbaled laser mounted in a pod under the F-4's wing. Officer, interview, 203-4.

[110] Boese, interview, 5-6.

Some crews voiced concerns over the cost of the new guided weapons, but Seventh Air Force saw their tremendous value. F-4 pilot James Hendrickson, for example was willing to commit laser guided bombs against important point targets, but "I refused to put them on trucks."[111] Although the Paveway bombs cost between $5,839 and $7,080 each, Seventh Air Force analysts determined this saved money when compared to larger multi-aircraft strikes that needed scores of bombs to destroy a small point target that could be destroyed by a very few Paveways.[112] When asked about the relative costs of American Paveways and North Vietnamese trucks, Gen George Brown, Seventh Air Force commander, remarked "it's expensive, but things don't relate in a straight line out there. A truck may cost six thousand bucks, and the [bomb] may cost ten, or twelve, or twenty thousand. I don't know how much it costs….If you relate it in relative GNP or some relative term, it then sort of brings it back into perspective, and it isn't so nutty." Most interesting though, Brown saw the risk-mitigating benefits of the laser bomb and advanced technology. "We've got a philosophy in the American forces where we don't worry about dollars where life is involved. So if by shooting up ordnance or dropping bombs or something, we can keep some doughboy from getting killed, this is a worthwhile investment. That's what we've got it for."[113]

The development of advanced technology, particularly laser guided bombs broke the dilemma that mandated high-risk attacks to ensure mission success during Commando Hunt. Although they were limited by small numbers of laser designators (Seventh Air Force had nineteen designators on hand at the end of Commando Hunt—twelve Zots and seven Pave

---

[111] Hendrickson, interview, 24.

[112] Porter, *Second Generation Weaponry in SEA*, 25-26.

[113] Brown, interview, 110-112.

Knifes), Seventh Air Force built much of their renewed Linebacker offensive around laser-guided bombs two months after Commando Hunt VII.[114] By dropping from the "stratosphere" as Lt Gen Boese put it, crews were able to kill without risk over Laos and later at a much reduced risk over North Vietnam in late 1972 and 1973. Without a proximate and real existential threat, the crew's combat motivation was not put to the same test as it had been in Rolling Thunder. Crews, then were more willing to accept limitations and went along with a war that they believed was not being won in order to pursue other goals—especially flying high performance fighters, and experiencing the thrills of battle at a reasonably safe distance, within the pleasant environment of an increasingly close-knit fighter unit, assuming they fit in by proving their proficiency as aviators.

Authority: "You Just Had to Depend on the FAC"

The control of USAF airpower over the Ho Chi Minh Trail experienced several changes during Commando Hunt. The performance of the expensive Task Force Alpha command and control center, funded by Igloo White, proved inadequate for the task of controlling the fast-paced operations over the Trail, and Seventh Air Force devolved to a more decentralized scheme run by their airborne controllers in their C-130 airborne battlefield command and control center (ABCCC, "Hillsboro") and forward air controllers. Fighter crews bristled against the ineffective centralized and ground-based control, but readily accepted the authority of the Trail FACs who were on the scene, and experienced the same risks as the crews carrying out attacks on the Trail. Many of the best fighter crews sought to exercise their own agency and sought positions within their wings as specially qualified jet forward air controllers. Jet FACs enjoyed the best of all

---

[114] Michel, *Clashes*, 206, 240.

possible worlds in the eyes of a fighter pilot—they enjoyed the speed, power, and maneuverability of a fighter jet, and exercised the agency, control, and flexibility of a forward air controller. Fighter crews saw the jet FAC crews as among the best in the wing, who gained further respect by flying for extended periods at lower altitudes and exposing themselves to greater risks. The greater risks accepted by jet FACs lowered the risks and increased the effectiveness the rest of the wing crews.

Igloo White's technological advances extended beyond new weapons and led to the development of new navigation, communications, and command and control systems. Air Force engineers modified LORAN (which stood for long range navigation), a system for ships at sea, and adapted it for airborne use over Southeast Asia. A squadron of hastily modified F-4s used LORAN to bomb precise coordinates provided by the Igloo White controllers at Nakon Phanom in poor weather and darkness. Capt Clark was a back-seat pilot trained in LORAN and saw its virtues, but believed the procedural changes that accompanied it imposed a harmful degree of micromanagement. From the outset of Commando Hunt I, Igloo White's ground controllers (using the call sign "Sycamore") tried to directly control all the assets over the Trail and match them against sensor activations, but the controllers lacked a system to give them a current picture of the air situation over the Trail. Capt Clark observed when Sycamore controllers came on line "the overnight change from [a] smooth working operation to monstrous confusion was apparent to everyone." Recognizing the command and control difficulties created by ground controllers with only a partial picture of a fast-changing air battle, Seventh Air Force relegated it to an intelligence and advisory role and returned decentralized control to the FACs and controllers orbiting over Laos in the airborne battlefield command and control centers (ABCCC). Clark

noted the "overnight improvement was amazing."[115] Clark and his peers were far more comfortable with loose, local control by nearby airborne controllers over more distant and directive control from a ground-based command center.

During Commando Hunt, aircrews willingly surrendered agency regarding what they hit to airborne forward air controllers. Although some grumbled about restrictive rules of engagement, there was far less seething anger towards authority as there had been during Rolling Thunder. Commando Hunt's lower loss rates generated by risk-minimizing tactics and the adoption of high technology cooled the emotions ignited during Rolling Thunder. Crews could grumble, but by 1970-1972, the loss rate over the Trail was so low that discontent over the conduct of the war was not being written in the lives of lost comrades as it had been between 1965 and 1968. Although crews in Commando Hunt widely believed the war needed to go back against North Vietnam in order to win, they saw their part of the mission represented by targets along the Ho Chi Minh Trail as relevant and worth attacking (although not war-winning). Although the rules of engagement in Laos were complex in order to protect Laotian civilians, the areas around the Ho Chi Minh Trail were nearly free fire zones. Because FACs directly supervised nearly all the fighter missions over the Trail, crews in Commando Hunt could allow the FAC to worry about the complex rules.[116] Fighter crews learned the applicable rules and then deferred to the FAC as a reliable authority because he controlled the strike. Capt Clark sarcastically commented that because the ROE got so complicated "it was just a waste of time. You just had to depend on the FAC [to] know the rules of engagement covering what you were

---

[115] Clark, interview, 13-15.

[116] A string of accidental bombings of civilian villages in early 1967 precipitated a contentious dialogue between senior military and State Department leaders in Vientiane, Saigon, and Honolulu that led to tight restrictions on air strikes in southern Laos. Van Staaveren, *Interdiction in Southern Laos, 1960-1968*, 217-225.

doing because you'd have to spend an hour, study every day I think to really keep up on the rules of engagement."[117] A-7 pilot Jerry Fleming voiced a more professional, but similar perspective, acknowledging his own responsibility but still deferring to the FAC. "I don't know if the FAC assumes responsibility of the strike. He's putting you in, and if he wanted to put you in on something that you weren't supposed to be put in on, then I think you would probably be expected to know that you weren't supposed to be put in on that." But Fleming and most of his peers did not pursue the issue, deferred to the FAC's authority and unique perspective, and would rather assume that they were doing their jobs correctly: "But those situations just didn't occur."[118]

Fighter crews were willing to surrender much of their autonomy to FACs because they were the experts on the Ho Chi Minh Trail, and because they experienced even greater dangers than the fighter crews. Covey FACs flew O-2s over the Trail from Danang while Nail FACs patrolled their sectors of the Trail from Nakon Phanom, and were given formal authority for strike control by the rules of engagement. But FACs also held informal power as the Trail experts. FACs spent hours circling over the Trail, compared to minutes of circling by the fighters due to their high fuel consumption rates. They became experts on different sections of the Trail and with experience, could spot small subtle changes. They also earned respect because they experienced greater risks orbiting in their slow spotter aircraft and diving down to mark targets with their smoke rockets. Initially equipped with O-1, O-2 and then OV-10s, the slow moving FACs were supplanted by growing numbers of jet FACs from 1967 as the threats along the Trail multiplied.

---

[117] Clark, interview, 43.

[118] Fleming, interview, 65.

During Commando Hunt, all the jet wings in Thailand developed jet FAC programs. Following the initial Misty FAC program that deployed two-seat F-100Fs over Route Pack One and Southern Laos in 1967. Based on the Misty's successes, the demand for jet FACs increased but was limited by a shortage of F-100F airframes.[119] Seventh Air Force elected to conduct a trial with F-4s from Danang assuming the FAC role in August 1968. The F-4Ds, flying with the call sign "Stormy" proved to be faster but had more limited visibility than the F-100F due to the F-4's big, blocky air intakes. Despite the limitation, Seventh Air Force deemed the test a success. "The Stormy FAC program showed that collocation of FAC and strike aircraft improved the results of strike missions and increased the quantity of real time intelligence for target location," which generated interest among the rest of the fighter bases. Ubon proposed its own jet FAC mission with the call sign "Wolf" and supplied three FAC sorties a day to Commando Hunt I. Tiger FACs operated from Takhli, and Falcon or Laredo FACs operated from Udorn in March 1969.[120]

Forward air control from jet fighters was an appealing mission and embodied everything many crews were looking for—increased agency, a larger degree of control of one's own mission and control over others, and relative freedom to rove an allotted area and hunt for the enemy in the ways they saw as most effective.[121] Fighter FACs enjoyed all three major appeals of flight: they experienced the power of flying a modern fighter jet, they enjoyed a high degree of flexibility in how they patrolled their sector and how they controlled air strikes, and they exercised control over other aircraft in their sector, since Seventh Air Force allowed few strikes

---

[119] Tactical Air Command estimated if it deployed four additional F-100Fs to Southeast Asia, it would have to cut fighter pilot training by fifty slots per year. Schlight, *Jet Forward Air Controllers in SEAsia*, 11.

[120] Ibid., 23-30.

[121] This is an allusion to a quotation commonly attributed to Manfred von Richtofen, the "Red Baron": "Fighter pilots have to rove in the area allotted to them in any way they like, and when they spot an enemy they attack and shoot him down, anything else is rubbish." Robert L. Shaw, *Fighter Combat: Tactics and Maneuvering* (Annapolis, MD: Naval Institute Press, 1985), 317.

without control from a FAC. There was a secondary payoff as well—fighter FACs also saw themselves as an elite cadre within their units, held in high regard by their squadron mates. All the FACs over the Ho Chi Minh Trail enjoyed a high degree of autonomy. Pete Lappin, an O-2 FAC, characterized his year over the Trail from 1968 to 1969 as "fun…because literally you were like your own boss. That was fun."[122] The jet FACs had an additional appeal because they flew "clean" jets often equipped with little more than fuel and marking rockets, unencumbered by heavy bomb loads. F-4 FAC Terrence McCollum recalled that "we just carried rockets and a gun, no bombs because you tried to be clean, you wanted the airplane fairly clean so you can go fast."[123] This clean configuration allowed them to sustain higher speeds, but also turn tighter and maneuver quicker (and enjoy many of the virtues of piloting a fast and powerful fighter jet). Although it was more dangerous, Jet FACs also enjoyed the experience of flying fast and low through the mountains of southern Laos, which enhanced the exciting sensations of speed and maneuverability inherent to flying fighters.

William Ricks enjoyed the jet FAC mission and saw its increased risks as manageable. "We had a great mission with the Wolf FACs. The back-seater had all the maps and he did most of the navigating and coordinating the strike flights while the pilot looked for targets. The Wolf FACs lost a couple or three airplanes. It was probably, at that time, one of the more hazardous missions that we were doing. We had very low overall loss rate at that time, because we were not flying regularly over North Vietnam."[124] F-100F FAC Charles Neel assessed his unit's loss rate

---

[122] Pete Lappin, interview by Stephen Maxner, September 1, 2000, 2, The Vietnam Archive, Texas Tech University.

[123] Terrance McCollum, interview by Michael McCollum, no date, 20, Veterans History Project. Library of Congress.

[124] Ricks made it through Rolling Thunder in the F-105 without taking a hit, but PAVN gunners struck home and damaged his aircraft with antiaircraft fire when he was flying an F-4 as a jet FAC south of Mu Ghia Pass on his second tour in Southeast Asia. Ricks, interview, 14-16.

"went down very definitely as a result of our experience." Like the Wild Weasel crews in Rolling Thunder, Neel became so confident in his abilities he considered jousting with active antiaircraft sites as "fun in a sense."[125] FACs managed the additional risk of their mission by changing their heading and altitude ("jinking") every few seconds to throw off the aim of antiaircraft gunners. They also tried to adhere to the conventional wisdom of survival for Southeast Asia by making only one pass, and staying above minimum altitudes. Perhaps due to his confidence, Charles Neel was shot down and rescued on a FAC mission, but "I consider it partially my own fault in a sense, and I think if you get hit it's because you were doing something you shouldn't have been doing."[126]

In squadrons with a mix of experienced and inexperienced crews, jet FACs attracted the best crews. F-4 pilot Terrence McCollum flew as a Wolf FAC from Ubon in 1970 and noted the FAC's special status: "there [were] only 13 guys in this operation….it was kind of selective. But a lot of guys wanted to do it."[127] Tim Ayres was attracted to the jet FAC program because it attracted the best "To me, that was the elite program over there at the time, so that ultimately, … is what I wanted to do."[128] Jet FACs enjoyed special recognition. F-4 WSO Marion Marshall recalled FACs at Udorn "had a beautiful patch, and I had always wanted to go down there," so he volunteered for the program.[129] Fighter crews appreciated the risks FACs assumed when working a target, which meant the fighters would not have to assume similar risks looking for targets on

---

[125] Neel, interview, 37.

[126] Ibid.

[127] McCollum, interview.

[128] Ayres, interview, 14.

[129] Marshall, interview, 26.

their own. Capt Clark observed "most of those guys were really good. I mean they'd get down there underneath the weather and root around amongst the karst to find that place and they really did good work."[130]

Motivation: "Basically War Was Our Business"

Commando Hunt's fighter crews shared the same initial motivations as Air Force aviators from other aircraft and other operations in Southeast Asia. All three groups of fighter crews—new pilots and navigators, experienced fighter pilots, and pilots and navigators cross-trained into fighters—were driven by a common passion for flying that provided an opportunity to test themselves and apply unique skills towards a challenging mission. Richard Hamilton, veteran of two Southeast Asia F-4 tours in 1965 and 1970, well described the inherent joys of flying a fighter jet, which fulfilled many pre-combat aspirations. "I don't know if you ever drove a Porsche or something like that, but when you strap yourself into an F-4…and step down on the pedal, it's about five hundred times better than that Ferrari and you can do it in three dimensions." In addition to the power, he described a sense of freedom achieved through flight. "You have the feeling that you own the sky up to fifty thousand feet and…if you're good at it you can do anything you want."[131] Clyde Edgerton (who wrote about the thrill of his first T-38 flight as described in chapter two) volunteered for UPT in late 1966 to achieve his dream of flying a fighter. He fell in love with the technical mastery of flight and the perpetual learning. He

---

[130] Clark, interview, 64.

[131] Hamilton, interview, 77.

volunteered for the F-4, an aircraft he described as the "fastest and most powerful fighter in the world." [132]

Many young fighter crews clamored to get into combat in Southeast Asia to prove themselves, while some others saw combat as a duty they accepted without enthusiasm. In 1968, experienced pilots were still volunteering for their chance to get into the war. Veteran fighter pilot Robert Mize, for example, volunteered for combat in 1967, but did not reach the theater until mid-1969, and called the delays in the system the "greatest disappointment."[133] Those less eager for combat accepted assignments through the machinations of the personnel system, and when their turn came, went to Southeast Asia. Some pursued assignments outside Southeast Asia to stay away from combat, but they remained in the Air Force by choice and the one tour policy eventually led to reassignments to the war. The alternative was to separate from the Air Force, either through resignation or retirement. For Clyde Edgerton, war was the price he had to pay in order to fly fighters. Upon entering pilot training, he believed "Vietnam was a small war and I hoped it would be over before I got my wings."[134] After F-4 training, Edgerton volunteered for duty in Japan, where he tried to wait out the war. It was still raging in 1970, and he faced a probable assignment to Southeast Asia, so he volunteered for duty in Thailand. By 1970 and later, the war caught up with many aviators like Edgerton who had found other Air Force assignments in the United States, Europe, and North Asia.

Although Edgerton was sympathetic to the antiwar movement by 1969, he was able to separate his feelings about the antiwar movement and his duties as a military pilot. America's

---

[132] Edgerton, *Solo*, 43, 103.

[133] Mize, interview, 19.

[134] Ibid.

domestic political divide had little appreciable effect on the combat motivations of Air Force aviators in Southeast Asia as they had to focus on the demands of flying. As Edgerton climbed into the cockpit, "started engines, pulled my oxygen mask to my face, and checked in on the radio," any antiwar or counterculture sentiments he harbored "vanished." He flew an OV-10 as a Nail FAC over the Ho Chi Minh Trail in 1971, did his duty and received a Distinguished Flying Cross for heroism in a rescue mission. Pilots' and navigators' motivation in combat was similar in many ways to fighter crew's combat motivation in Rolling Thunder. Aircrews focused on the technical side of flying, and while they were in the air they had little opportunity to think about much else.

Air Force fighter crews believed they could handle Commando Hunt's relatively benign threat environment, which eased combat motivation problems. Improved technology and risk-limiting directives helped resolve the dilemma between mission and risk crews encountered during Rolling Thunder. Just as fighter crews recalled few combat refusals in Rolling Thunder, by Commando Hunt, even fewer aviators were unable or unwilling to fulfill their flying duties. None of the aviator's memoirs and oral histories recount any combat refusals during Commando Hunt. Steve Ritchie flew two combat tours in the F-4 during Commando Hunt and recalled although some aircrews were reluctant to fly, none refused to do so. "I do know of a couple of cases where guys had one excuse after another for not flying and it was pretty widely known that they just didn't want to fly, but I never knew of a case that a guy absolutely refused to fly."[135] Likewise Jerry Fleming flew two fighter tours from Korat and asserted positively no aviators refused to fly "I had no knowledge of that. Not only did I have no knowledge of it, I know it didn't occur."[136]

---

[135] Ritchie, interview, 103-104.

[136] Fleming, interview, 84-85.

As in Rolling Thunder, squadrons sought opportunities to send poor flyers away by reassigning them to staffs. A.P. Clark recalled three pilots his squadron sent to the staff at Seventh Air Force. One was a poor pilot, "there were some guys which you know was obvious why they were sent down there because they were dangerous and nobody wanted them." The others went to Saigon for more mixed motives: partly to enhance their careers, and partly because they didn't fit in well.[137] Robert Belli recalled his wing sent a pilot to the staff in Saigon in order to keep him from killing himself. "He wanted to stay there but we sent him down to Seventh Air Force….We did that primarily to save his own life and somebody else's life." Belli assessed a lack of combat motivation did not lead to combat refusals, but it manifested itself in unaggressive flying. "I saw a lot of fellows that didn't like mixing it up. They dropped their bombs at very high altitudes so they wouldn't expose themselves to fire from small arms and antiaircraft." Such risk avoidance did not present a problem in Commando Hunt because it aligned with the command emphasis to limit losses, even if it came at the expense of mission effectiveness. Belli believed risk tolerance was part of a natural distribution among his peers. Some dropped from high altitude, while some aviators accepted undue risks in Commando Hunt: "I've seen other fellows that were just on the other extreme were so damn foolish that they'd go down there within three, four hundred feet where the small arms could hit you….there were extremes." Despite the variance, nothing Belli saw caused concerns about a gross failure of combat motivation: "I never saw any cowardice the whole time I was there that I was aware of."[138]

As the dangers of flying in combat eased in Commando Hunt, challenges to sustaining motivation (the will to return to battle) decreased proportionately. As the challenge to sustaining

---

[137] Clark, interview, 46-47.

[138] Belli, interview, 117-118.

motivation decreased, the motivational culture changed within the Thailand-based fighter wings. Although airmen highly valued the good opinions of their peers, Rolling Thunder's intense individual-centered 100-mission honor culture disappeared as a group-centered fighter squadron culture grew in relative prominence.

The honor culture built around the 100-mission patch vanished in November 1968 with the bombing halt over North Vietnam. Mission count ceased to be the ultimate measurement of one's personal courage as tour lengths shifted to a year for all aircrews. After the November bombing halt, only a few reconnaissance missions regularly flew over North Vietnam, so crews were unable to get enough missions over the North to qualify for the 100-mission patch. Most missions took place over Laos, and by Rolling Thunder standards, those missions did not count in the quest for the 100-mission badge of honor. After January 1966, Rolling Thunder, fighter pilots called missions over Laos "non-counters" since Air Force began counting only missions over North Vietnam towards the 100-mission credit and combat tour curtailment.[139] When Ed Rasimus returned to Korat in the F-4 1972, three large plaques held the names of approximately 320 aviators who completed one hundred missions over North Vietnam, but they seemed to garner little attention in the underused officer's club bar.[140] After Rolling Thunder, fighter combat tours in Thailand became less goal oriented. The objective became to survive a year, enjoy the flying, and earn the respect of one's squadron-mates through competent flying.

Rasimus, a Rolling Thunder veteran, found it "strange" that in 1972, few fighter crews frequented Korat's underutilized officer's club bar.[141] The wing bar, once packed in 1967, had

---

[139] Sorties over Laos counted towards 100 before January 22, 1966, but did not count by Headquarters USAF policy due to the relatively low losses over Laos. Little and Spink, "USAF Personnel Rotation in Southeast Asia (A Chronology) 1961 through 1968," 10.

[140] Rasimus, *Palace Cobra*, 38.

[141] Ibid., 38-39.

yielded to a growing fighter squadron culture that reinforced strong ties of social cohesion between aviators within squadrons. Longer tour lengths, squadron-centered socialization, and symbols of squadron identity elevated squadron culture during Commando Hunt. Before the bombing halt, unit turnover and the pace of operations provided limited opportunities to create strong squadron identities. Aviators reached one hundred missions in an average of seven months, and Rolling Thunder's heavy losses led to squadron turnover of about 200 percent per year. With tours fixed at a year after 1968 and low combat losses, squadrons experienced half the turnover as Rolling Thunder. These conditions during Commando Hunt were conductive to rapid formation of social ties. As in Rolling Thunder, crews lived in close proximity to each other in two-man rooms that were part of a larger squadron dormitory complex. But most significantly, between Rolling Thunder and Commando Hunt, the locus of social activity shifted from the wing's officer's club to smaller and more close-knit squadron bars. Squadrons ran unit bars where drinking, singing, poker, dice games, and conversation about flying became the center of daily existence outside of flying. Ed Rasimus observed upon his return to Korat that most fighter crews avoided the officer's club in favor of the squadron bar that could better "accommodate our colorful vocabulary and rather bizarre concepts of nightly entertainment."[142]

Squadrons published unit song books that extolled the virtues of the unit's aircraft, griped about the war and headquarters, or described mythical female's sexual appetites or gymnastic capabilities. Songs elevated heroes and criticized villains, helping form a common identity. This is a portion of one song memorializing a brave OV-10 FAC's last mission over the Trail:

> *The FAC, he rolled right in with his smoke to mark*
> *Exactly where that truck was parked.*
> *The rest is still in doubt, for he never pulled out.*
> *Hmmm Hmmm Hmmm*

---

[142] Ibid., 43.

Refrain:

Dear Mom, your son is dead, he bought the farm today.
He crashed his OV-10 On Ho Chi Minh's Highway
He made a rocket pass, and then he busted his ass
Hmmm Hmmm Hmmm[143]

Another popular song acknowledged the dangers over the Trail and picked up the common theme of line crews struggling against the deception and ignorance of out of touch senior officers and their headquarters staffs. "Tchepone" railed against a headquarters colonel who sent a mission against the heavily defended Trail nexus at Tchepone, Laos and promised it would be a "milk run." One section reflects the danger over some well-defended parts of the Trail and lack of accountability of headquarters:

I make it back home with six holes in my bird.
With the colonel that sent me I'd sure like a word

He's nowhere around though I look near and far.
He's gone back to Seventh to help run the war….

I know that there's places I don't like to go,
down in the Delta and in Tally Ho

But I'll bet all my flight pay the jock ain't been born
Who can keep all his cool when he's over Tchepone.

Refrain:

Oh, don't go to Tchepone[144]

---

[143] Dick Jonas, *RBAAB: The Red-Blooded All-American Boy* (Ft. Mojave, AZ: Erosonic, 1997), 5-26.

[144] Ibid., 1-20.

Both of these songs, and countless others that populated squadron songbooks, provided a safe and public means to admit the dangers of and common fears generated by combat flying. As noted in the chapters on Rolling Thunder, flyers bottled up their private grappling with danger, and admissions of their own mortality. The gallows humor of "Dear Mom Your Son is Dead" admitted openly that these men were engaged in a dangerous business, and the lives of aviators ended suddenly and without warning, either by enemy action or by flying mishap (because the "the rest is still in doubt, for he never pulled out"). Finding humor or irony in death provided a means to exert control over one's reactions to stress and relieve stress. Such songs also helped create a common identity as they provided an acceptable means to publicly admit fear and mortality—subjects one was not able to talk about.

Squadron identities were further enhanced during happy hour or informal squadron festivities when crews donned garish "party suits"—custom tailored flight suits made in bright squadron colors and bedecked with numerous patches. Clyde Edgerton called them "a pilot's motorcycle jacket," which identified a motorcyclist as a member of a riding group and an aviator as a member of a squadron."[145] Rituals such as unit dining ins (formal unit mess dinners) further cemented unit identities, made explicit ties to aviators of the past, and provided opportunities to remember departed comrades, relieving stress in a formal, but similar way to singing macabre bar songs. Ed Cobleigh was moved by the formal toast to lost squadron mates at a unit dining in. "We all manage to choke out 'To our departed comrades'" in recognition of two comrades lost that week. "When the last drops of wine are gone, the commander and operations officer turn and hurl their glasses against the nearest wall, following a tradition dating back to the Royal Flying Corps

[145] Edgerton, *Solo*, 229.

in WWI."[146] A two-tour veteran of Southeast Asia, Lt Col Bob Ross assessed monthly unit barbeques led by one of his F-4 squadron commanders had an exceptionally strong impact on the unit's cohesion: "squadron parties created bonds of affection and mutual appreciation of each other [especially between the pilots and maintainers] and our mission. Morale soared, and the squadron became an even more efficient, motivated, and effective combat unit" as these groups pulled closer together.[147]

The flight schedule and the nature of air combat afforded ample opportunities to form close bonds rapidly within this environment. Most aviators flew four to six times a week, and combat sorties consumed the better part of an eight-hour day. Flyers spent the rest of their duty time performing additional duties like scheduling, safety, and standardization and evaluation. Fighter crews had more time off the flying schedule during Commando Hunt than their predecessors in Rolling Thunder because one-year tours made unit manning requirements more predictable. The personnel system had a difficult time keeping F-105 squadrons at full strength in Rolling Thunder because of the short tours and pilot losses, and the manning levels at Korat dropped to 55 percent in May 1966.[148] William Ricks arrived at Korat in May 1966 and felt the effects of under-manning. "On my first tour, we didn't do anything except eat and sleep and drink and fly. You were always scheduled to fly once every day you were on base, sometimes twice, or once and a spare, if you weren't flying you were doing something toward the flying effort. After

---

[146] Cobleigh, *War For the Hell of It*, 207-225.

[147] Ross, *The Warriors*, 211.

[148] According to Col Monroe Sams, the 388th Wing Commander, "during the period January through April 1966, assigned pilot strength ran consistently at 75 per cent. During May the percentage dropped to 55 per cent. The situation improved to 82 percent during June." Little and Spink, "USAF Personnel Rotation in Southeast Asia (A Chronology) 1961 through 1968," 18.

six months you were really pretty burnt out."[149] Because combat was episodic, and crews had more time off in Commando Hunt, there were ample opportunities to socialize every day within the squadron operations facility, squadron bar, or dormitories.

Squadrons helped sustain motivation by awarding status to the best aviators, ostracizing those who did not measure up as good fliers, and by providing an important support system. Squadron commanders and operations officers quickly sized up new aircrews and picked leaders based on merit in accordance with the fighter culture. Experienced fighter pilots checked out quickly to lead fighter missions, while fresh pilot training graduates were assigned as wingmen. Within cockpits, experienced navigators teamed up with inexperienced pilots (and vice versa) to level experience and bring new aviators up to speed quickly. Although a highly experienced WSO might be capable of leading a flight, flight leadership was located exclusively in the front seat, and the pilot's qualification determined the overall qualification of the crew. Cross-trained pilots presented a problem because their rank and experience normally exceeded their capabilities as fighter pilots. Newly-arrived field grade officers (majors, lieutenant colonels, and colonels) might wear the rank, but lacked the ability to lead fighter missions in combat. This could be difficult for a former SAC lieutenant colonel to have to fly as the lowest man (commonly called "Blue 4") in a four-ship formation. Some aggressive and adaptable cross trainees could and did learn quickly and some eventually became capable flight leaders, but this was difficult for many accustomed to different flying demands.

Squadron commanders often assigned pilots with rank and responsibility mismatches out of the fighter squadron to wing staff positions. When F.C. Blesse served as the 366th TFW director of operations at Danang in 1967 and 1968, he estimated many of these aviators probably

---

[149] Ricks, interview, 14.

sought fighters out of pilot training but were unable to obtain one. He assessed "by and large most of these guys did a pretty respectable job, especially when you consider the fact they had no fighter training before that." To qualify his generous appraisal, Blesse added those who could not lead in the air should not be given flight leadership responsibilities by their wing and squadron commanders, but might be suitable to fly as wingmen. He also observed "some of the guys did not do a good job; there is no way around that, some of them just did not. But we could identify them at Da Nang. We had a guy who did not make a good combat pilot and did not want to fly combat, so we made a test pilot out of him. He did not fly combat any more, he just flew the test hops."[150] There were also those who did not adapt to fighters and stayed wingmen. As already noted, other aviators who did not fare well in fighters were often sized up by their squadrons quickly and then shunted off to administrative staff jobs at wing headquarters or sent to Seventh Air Force Staff in Saigon. Acceptance by the crews of a fighter squadron provided a powerful supporting system. Ed Cobleigh summarized the role played by the squadron community. A major, unable to master his fears of combat withdrew from the squadron community and suffered through his tour until he was killed in combat "cut off from the emotional support and camaraderie that makes life in a fighter squadron so intense and makes combat possible."[151]

Experienced fighter pilots back for their second and third combat tours provided the backbone of the Air Force's fighter squadrons during Commando Hunt. All volunteered to return to combat, even though none were required to do so by the one tour rule. Their rationale to return to combat emphasized duty and a zeal for exciting flying, which served as the basis of their sustaining motivation. In spite of a growing anti-war sentiment and a strategy many aviators

---

[150] Blesse, interview, 26-27.

[151] Cobleigh, *War For the Hell of It*, 54.

believed would not lead to victory, substantial numbers of aviators—enough to provide a nucleus for each of the theater's fighter squadrons—returned to combat in Southeast Asia during Commando Hunt. Many participants voiced a simple rationale for the war—to defend the United States, to defend the South Vietnamese, and to fight America's enemies. John Parker flew RF-4s in 1968 and F-4s in 1972, and thought there was "absolutely… no question about it," the Vietnam War was a fight the United States should fight.[152]

Below the level of basic U.S. policy, fighter crews did not believe the United States was fighting to win, and believed that the U.S. needed to go back North to take the fight to the enemy, win the war in the North, and win the freedom of the POWs. Until the United States was ready to return to North Vietnam's skies (which occurred a month and a half after Commando Hunt VII ended), fighter aviators described year-long tours as aimless, not even qualifying as a war. William Reich, an F-4 WSO reflected "Vietnam, in some ways, wasn't a war. People went over for their year. Earlier, they went over for their hundred counter flights. When I was there you had to be there a year regardless. You went over for a year and kind of filled the square and left, and people tended to look at it that way."[153] Ken Alpers flew over the Trail as an F-4 WSO in 1971 and saw little meaning in the missions he flew, except for one strike into North Vietnam to eliminate a SAM site threatening operations over the Trail. He recalled the mission against the SAM site "was pretty exciting. It was about the only thing we did that seemed to make a whole lot of difference during that first tour. The rest of the time I spent trolling around the jungles of Laos, dropping bombs on suspected truck parks and monkey farms and toothpick factories,

---

[152] Parker, interview, 20.

[153] Reich, interview, 12.

making small trees out of big trees." Yet, despite this lack of meaning, Alpers asked for a stateside tour in F-4s after returning from Southeast Asia and then returned to the war in 1972.[154]

Despite the dissatisfaction with the course of the war, the nucleus of each fighter squadron was the experienced career fighter pilots who volunteered to return for their second and third combat tours over Southeast Asia. Col Clarence Anderson, a triple ace and World War II, Korean, and Vietnam veteran, was nearing retirement in the Pentagon and was offered command of the 388th TFW at Korat in 1969. Even though his friends objected Vietnam "was a lousy war [and] the nation wasn't united behind it." Anderson volunteered, recalling "duty" was part of his decision, "a pretty big part." But his sense of duty strongly aligned with his desire and inclination to fly. Reflecting on his decision to return to war, Anderson wrote "the mission of the Air Force is to 'Fly and Fight' after all. And besides, flying and fighting seemed a lot better than being held hostage in the Pentagon."[155]

Anderson and many other experienced fighter crews saw the war as a means to get back into a fighter cockpit or to avoid an undesirable non-flying or non-tactical position. William Ricks wanted to fly fighters, but believed flying in combat gave him a purpose beyond just flying a powerful and exciting aircraft. "As aviators, we got kind of selfish. It was a lot of fun. It really is. There's nothing like flying an airplane, especially a fast, high performance airplane, but when that airplane doesn't have a mission, then it's a very expensive toy."[156] Robert Belli was angered over the political limitations during his first tour in 1968, "I was very disillusioned when I finished my tour and…because of the political handling of the war and the fact-that I had been

---

[154] John Alpers, interview by Dr. James C. Hasdorff, May 8, 1992, 13-14, Air Force Historical Research Agency, Maxwell AFB, AL.

[155] Anderson, *To Fly and Fight*, 279-280.

[156] Ricks, interview, 25.

there during a real intense campaign in early 1968 against the North and then watched that bombing halt stop." Although "we all questioned a lot of the motives and objectives of the war," he volunteered to return to leave a staff job at the Pentagon. "I wanted one more flying job. I thought that basically war was our business. You only have a chance to gain experience while the war is going on. So I volunteered to go back a second tour."[157] Belli demonstrated a warrior spirit because he saw himself as a warrior, and if the Air Force was fighting a war, he should be there.

Others demonstrated this same attitude by volunteering for duty in Southeast Asia to get back into combat after relatively safe, but boring training assignments. Kenneth Johnson had completed a year-long tour in Vietnam flying F-100s, followed by FAC and fighter training assignments in the United States. Although he enjoyed flying the sporty F-5 as a fighter instructor, he yearned to return to combat flying for the sense of purpose. "The training business…gets old. It's not real operational flying." Johnson also believed he needed to return to combat to grow as a fighter pilot. "As an instructor pilot, you don't progress much beyond what you are teaching your students…. and it just becomes a treadmill. After awhile you kind of say, 'Well, I'm just tired of doing the same thing over and over again. I've got to get back in the real world.'" Johnson volunteered to fly the F-4 and returned to combat in 1971.[158] Ed Rasimus also left training command to return to combat. For Rasimus, Southeast Asian duty was the price to get back into fighter training. Because fighter training was running at capacity for most of the war, pilots who received fighter requalification training had to return to combat.[159]

---

[157] Belli, interview, 7, 115-116.

[158] Lt Col Kenneth R. Johnson, interview by Dr. James C. Hasdorff, July 26, 1991, 20-22, Air Force Historical Research Agency, Maxwell AFB, AL.

[159] Rasimus, *Palace Cobra*, 8.

These reflections, many recorded years after the war, may register some after the fact justification, but they represent the best sense men could make, and admit publicly, why they volunteered to return to a war that they believed was unwinnable. They asked to go back (and many paid a price at home with their wives and children) to a war that they had already flown in and completed their obligation. The Air Force's one tour policy ensured they could serve out the remainder of their careers honorably without returning to Southeast Asia. Yet for some, their sense of duty extended beyond what their service asked, and for others, their desire to exercise the power, control, and freedom of flying in combat had become part of their identity as aviators and drew them back. When they returned to combat in Commando Hunt, they applied increasingly sophisticated and effective technology, and to some extent that technology eased their decisions to return because combat had become less risky. The fighter crews who flew over the Trail at night often cooperated with the AC-130 gunship crews, men who operated converted cargo aircraft loaded with guns, sensors, and computers in a system that represented the ultimate in American technological achievement in Southeast Asia. These men, their technology, and how they experienced the mission and risks of hunting trucks along the trails of the Ho Chi Minh Trail are the subject of the next chapter.

Chapter 10: Gunships in Commando Hunt

As fighters and FACs roamed the sky over the Ho Chi Minh Trail in the daylight, at night, a small cadre of airmen operated a tiny fleet of aging aircraft equipped with America's most sophisticated technology in an attempt to deny the cover of darkness to the PAVN. A refurbished World War II light bomber, the B-26K Counter Invader, operated over the Trail between 1966 and 1969. Lacking night sensors, it worked as a team with C-123 and C-130 transports modified to drop parachute flares and early light amplification systems called night observation devices (NODs), popularly known as "starlight scopes." The C-123 (call sign Candlestick) and C-130 (call sign Blind Bat) crews had special training in forward air control in order to identify and direct attacks on the Trail at night. These hunter-killer teams fought alongside the more exotic AC-123K Black Spot and B-57G Tropic Moon. These aircraft, highly modified transports and light bombers featured cutting edge infrared, low light, and radar sensors. These aircraft were the earliest attempts to combine advanced sensors and bombs in a single airframe to detect and attack targets at night in a single pass.[1] Neither aircraft was deemed a success because their early sensors were unable to see trucks on jungle trails far enough ahead to drop a bomb in a single pass.

Only gunships—cargo aircraft converted into attack aircraft through the addition of side-firing weapons—delivered the desired performance over the Trail at night. The earliest operational Air Force gunships were World War II vintage C-47 Gooney Birds modified with the

[1] The AC-123K carried hoppers of cluster bombs in its belly, the B-57 carried early laser-guided bombs.

addition of three 7.62 millimeter miniguns. The small rotary guns fired up to six thousand rounds per minute (each), laterally out the left side of the aircraft. The aircraft commander flew in a left turn around the target and fired the guns through a sighting reticule mounted over his shoulder. Side-mounted guns allowed the crew to keep the guns trained on the target indefinitely, while fighters or bombers like Black Spot and Tropic Moon had to reposition between bomb runs, and often lost sight of their targets in the process. Initially designed to provide close air support to isolated special forces camps, the AC-47s called "Spooky" or "Puff the Magic Dragon" flew briefly over the Ho Chi Minh Trail between January and July 1966. Although AC-47s flew months of successful interdiction missions, their 7.62 millimeter guns were no match for North Vietnamese thirty-seven millimeter antiaircraft guns encountered in Laos and they were withdrawn after four combat losses.[2] The small caliber miniguns had a very short range, mandating operations at low altitude. Although low altitude operations were suitable for South Vietnam where the small arms posed the main threat, heavier anti-aircraft guns encountered over the Trail mandated their withdrawal.

In response, Air Force engineers modified the larger, more powerful and modern C-130 with larger and longer range twenty millimeter guns in a test called Gunship II. This flying experiment combined powerful side-firing guns with an aiming computer that integrated infrared, optical, and radar sensors to compute aiming data projected in the pilot's gun sight. The C-130's large payload allowed multiple sensors, flares, guns, and operators to integrate on a single platform, creating a previously unseen synergy. Flight engineer Gary Knecht was on the crew of

---

[2] The 7.62 millimeter minigun had an effective range of 5,500 feet mandating its use from an altitude of only 3,000 feet above the ground. This was well inside the thirty-seven millimeter's 14,000 foot maximum range. Jack S. Ballard, *The Development and Employment of Fixed-Wing Gunships, 1962-1972*, United States Air Force in Southeast Asia (Washington DC: Office of Air Force History, United States Air Force, 1982), 44-47, 120, 188.

the initial test aircraft and deployed to Nha Trang Vietnam in September 1967. After conducting tests over South Vietnam, Knecht recounted their first trials over the Trail: "we got this mission to take off at Nha Trang and fly over the trails to Ubon….We would leave about 6:30 at night, fly across the trails, [and] shoot trucks on the way over." At Ubon AB, Thailand the crew reloaded and would then "come back and shoot trucks, and get back at 6:30 in the morning" Knecht believed their early success "is why there is the [AC-130 Gunship] squadron today."[3] When the prototype gunship testing concluded in December, the prototype was scheduled to return to the United States for seven months of reworking. General Westmoreland asked General Momyer to find a way to use the ship during the dry season, so Momyer directed a bare essentials rework and returned the machine to the theater on February 12, 1968.[4]

The men who flew gunships over the Ho Chi Minh Trail reveled in a clear-cut mission that they were incredibly proficient and successful at. The unique combination of high technology and training allowed gunship crews to enjoy the highest routine, and apparent, mission success of any group of aviators in Southeast Asia. Their visible successes in destroying trucks each night over the Trail was highly motivational as crews derived pride and status from their nightly victories, which helped them override fears as the dangers mounted over successive campaigning seasons over southern Laos. Their aircraft's cutting-edge technology put unique power at their disposal and allowed gunship crews to operate with a high degree of autonomy over the Trail each night. Within the aircraft, its technology led to a shared control between a cohesive team of pilots and navigators. This shared control was founded on unique and interdependent individual expertise needed to succeed in a common mission. Unlike SAC's rigidly structured bomber crew

---

[3] Knecht, interview, 22-23.

[4] Ballard, *The Development and Employment of Fixed-Wing Gunships, 1962-1972*, 88-90.

hierarchy, gunship missions were far more fluid as crews roamed the Trail, which led to a fluid form of control that shifted between the aircraft commander, navigator, and fire control officer during different phases of a mission.

Flying the AC-130 Gunship: "Everybody Got Down to a Good Working Routine"

Large mixed officer-enlisted crews manned the AC-130 gunships. The flight deck included the standard C-130 crew of aircraft commander, copilot, flight engineer, and navigator. Below and behind the flight deck, four other navigators ran and managed the AC-130s sensors from inside a lit and air conditioned booth designed to house the gunship's sensitive electronics. One officer manned a low-light television camera and screen that included a laser designator, a second operated the infrared sensor used to locate and track the heat from trucks.[5] A third operator, trained as an EWO operated a sensor called "black crow" designed to detect the electronic signatures of truck ignitions. Each of these different sensors had strengths and weaknesses. The black crow had the longest range detection capability—able to see trucks as far as ten miles, but it lacked the accuracy needed to fire the gunship's weapons. The more precise infrared and television sensors provided precise views of a small area, but were akin to looking through a soda straw and needed queuing from other systems to reliably locate truck targets. A fourth and highly experienced navigator served as the fire control officer (FCO, pronounced "foco") who directed and integrated these various sensors. Interestingly, the fire control officer position moved from the booth in early gunship models onto the flight deck in the most advanced versions. This move consolidated a locus of control onto the flight deck, where the aircraft commander, navigator, and fire control officer could coordinate more closely.

---

[5] Early AC-130A gunships featured a swivel-mounted night observation device, or NOD (starlight scope), which was replaced by the low light television in later models.

Four enlisted gunners loaded and maintained the gunships' cannons in the noisy, wind blasted and dangerous cargo bay. Gunner Howard Fackrell (who served on both AC-130 and AC-119 gunships) wrote that gunners had to learn "operation of the guns, how to clear gun malfunctions, loading procedures, and weight and balance of the aircraft which is critical."[6] Gunners came primarily from munitions career fields and had to be physically fit to operate in an unpressurized aircraft, exposed to wind and cold and load heavy clips of forty millimeter cannon shells or forty-eight pound 105 millimeter shells.[7] Unlike most crewmembers, they were not strapped to a seat. They stood beside their guns when the aircraft went into battle, and had to dodge the fast-acting guns and wade through ankle-deep piles of hot brass that piled up in the gun bays throughout the course of a mission. Gunner Jeff Noecker recalled unintentionally knocking down a senior general to keep him from standing in the recoil path behind one of the AC-130's powerful cannons during a mission over the Trail. "We were always VERY careful to keep our hands away from [behind the gun] during firing as it could take off a hand and never slow down. There was also the issue of an expended brass round headed out of the back of the gun at the speed of heat as the gun was firing."[8] The lack of restraints could be a source of injuries when the pilot had to take evasive action. AC-130 pilot Kenneth Negus observed that anyone unrestrained in the aircraft stood a chance of being injured, but gunners especially could jeopardize the aircraft because "they might have a clip of ammunition in their hands when they went through the

---

[6] Fackrell served initially as a gunner on AC-119s in Vietnam and then later in his career on AC-130s. MSgt Howard S. Fackrell, "The AC-119K Gunship Program Vietnam--My Second Tour," 2, The Vietnam Archive, Texas Tech University.

[7] Lt Col George F. Hall, interview by Lt Col Robert G. Zimmerman, July 15, 1975, 12, Air Force Historical Research Agency, Maxwell AFB, AL.

[8] Noecker's visitor was likely Lt Gen Winton W. Marshall, Vice Commander of 7AF. Jeff Noecker, "The General," accessed December 31, 2009, http://www.spectre-association.org/library/documents/war_stories/TheGeneral.pdf.

evasive action."[9] Howard Fackrell, the AC-119 and AC-130 gunner provided a small vignette of the demanding physical circumstances gunners faced. On his first combat mission in Southeast Asia his AC-119K crew diverted from an interdiction mission in Laos to an emergency troops in contact situation in South Vietnam. "After ascertaining that none of our troops were anywhere near the [perimeter] we started shooting up the jungle one mini-gun at a time. Then the unforeseen happened—one of my gunners got air sick and puked all over the floor, then my second gunner slipped, fell, and started puking, then the illuminator operator got a smell of it and he started puking. What a situation—the bad guys are shooting hot and heavy at our troops and a third of our crew are puking their guts out. So I grabbed the Stan-Eval person and between him and I we kept the guns reloaded for the pilot."[10]

The last two enlisted positions, the scanner and illuminator operator served as the gunship's eyes. The pilots and sensor operators generally focused inside the circular flight path intent on destroying their target below and to the left. These two enlisted aircrew members came primarily from maintenance career fields, and scanned outside the aircraft's flight path and directly below to detect threats and direct the pilots to maneuver when warranted. The scanner sat in an open hatch on the right side of the aircraft. The illuminator operator laid prone on the aircraft's open tail ramp and scanned directly below the aircraft. Because the illuminator operator had the best all-around unrestricted view of threats firing from below the aircraft, there was an incentive to extend his body out into the slipstream to the waist to be able to see clearly in all directions. Flight Engineer Gary Knecht noted that many illuminator operators wedged long sturdy log flares into the end of the ramp to give themselves something more substantial to steady

---

[9] Negus, interview, 14.

[10] Fackrell, "The AC-119K Gunship Program Vietnam--My Second Tour," 5.

themselves with. This was particularly important when the pilot maneuvered the aircraft away from threats because "these guys would lose complete contact with the airplane and actually float out into the slipstream of the airplane, tethered with the cable to the inside of the airplane. Then they'd have to pull themselves back in."[11] Despite the potential for a wild experience, scanners and illuminator operators had to be calm and precise with their threat assessments because anti-aircraft fire, from detection to impact was only six to seven seconds at typical gunship operating altitudes.

Effectively coordinating the actions of fourteen or more crewmembers presented a leadership challenge to the gunship aircraft commanders; few other Air Force aircraft operated with crews as large.[12] Gunship squadrons were a mixture of TAC's troop transport and special operations communities, and they fostered a culture of innovation and adaptation. Throughout Commando Hunt the AC-130 was an immature and rapidly developing weapon system, and crews routinely developed new procedures on the spot. Because the technology developed so rapidly, one aircraft (tail #490—officially nicknamed "surprise package," but informally called "Super Chicken" by its crews[13]) was kept in theater as an ongoing experimental test bed for new

---

[11] Knecht, interview, 26, 37; Negus, interview, 14.

[12] Only command and control and surveillance aircraft like the EC-121 routinely operated with crews of 10 or more.

[13] "Super Chicken" was a 1967 tongue-in-cheek cartoon character who changed from an unlikely and ordinary bird into the somewhat inept "super chicken" hero, mirroring the ordinary C-130's transformation into a powerful gunship. The Super Chicken lyrics were popular, catchy and appropriate for the AC-130:

> *When you find yourself in danger*
> *When you're threatened by a stranger*
> *When it looks like you will take a lickin' (cluck, cluck, cluck, cluck)*
> *There is someone waiting who*
> *Will hurry up and rescue you*
> *just call, for Super Chicken! (cluck, awk!)*

"YouTube - The Super Chicken Cartoon Theme Song," accessed December 30, 2009, http://www.youtube.com/watch?v=FKss2pBYQ6Y.

technology.[14] This approach lent itself to rapid adaptation and quick solutions to new problems. For example, new sensors and technologies, like the addition of a laser-designator allowed better gunship-fighter cooperation, which developed "on the fly." These conditions did not lend themselves to well-developed checklist solutions and SAC-like by-the-book operations. Without solid crew coordination, the crews could create a Tower of Babel on the intercom, perhaps missing critical threat calls from the scanner or illuminator operator. One method to achieve effective crew coordination was the use of "formed crews" who flew together all the time. Although early gunship crewmembers like Gary Knecht did not see a need for formed crews "everybody had their own job, and they all worked together anyway," others acknowledged that some SAC standardization (imported by former SAC crew-members) could be helpful.[15] William Hartman, a senior fire control officer, found SAC's influence on pushing the gunship community into flying with regular crews helpful. "The organization was formed primarily from troop carrier people, who are not crew integrity oriented, because they suppose if you're qualified to fly in your position in the airplane, you can fly with any crew. So these people were not used to this crew integrity [principle] where the SAC type of people were." Although Hartman was a TAC navigator from troop-carrying C-130s, he saw the value of some SAC-like standardization. "I think [formed crews] paid off….Because the gun crews got used to each other and the scanners and the people in the booth. You didn't have to call your position. You knew from the voice and the cockpit knew from the voice what was going on. And the briefings became much simpler.

---

[14] Lt Col William B. Hartman, interview by Maj Lyn R. Officer and Lt Col V. H. Gallacher, December 11, 1972, 11, Air Force Historical Research Agency, Maxwell AFB, AL.

[15] Knecht, interview, 41-42; Lt Gen William H. Ginn, interview by Hugh N. Ahmann, June 1987, 31-32, Air Force Historical Research Agency, Maxwell AFB, AL.

And everybody got down to a good working routine, which you need when you're flying night after night, and, again, that many people on the intercoms."[16]

Mission: "The Reward was Hitting the Truck"

AC-130 gunship crews had an unambiguous and important mission—the destruction of trucks—that they were well trained and equipped to carry out throughout Commando Hunt. An optimal combination of high technology and training created a unique synthesis able to deliver scores of nightly victories over trucks that kept crews highly motivated throughout successive campaigns. Even though many airmen outside the gunship community believed the Air Force was marking time in Laos and the war needed to return to North Vietnam, gunships were too vulnerable to operate over North Vietnam, and gunship crews were proud of the role they were able to fulfill over Laos. The men who flew gunships had few second thoughts about their missions because they viewed their mission as one aimed against material, rather than men. Many drivers abandoned their vehicles as a gunship appeared overhead. At the end of Commando Hunt, gunships were re-assigned to close air support duties over South Vietnam, which provided the same powerful motivational linkages experienced by forward air controllers and soldiers on the ground as described in Chapter Seven.

The AC-130 was uniquely suited to the night interdiction mission and the crews drew their identity and purpose from that unique niche. The aircraft's combination of sensors, computers and truck-killing cannons pulled together all the separate areas of expertise and skill within the crew and created a unique synergy. The crew's collective efforts were required for success because each sensor and weapon had valuable contributions but significant limitations.

---

[16] Hartman, interview, 5-6.

The electronic Black Crow sensor, for example had good range but poor accuracy, while the infrared had good definition but needed queuing from systems like the Black Crow. Fire control officer Steve Opitz assessed that "the whole mission of the bird was to find, acquire trucks, [and to] put all these skills together—everybody had to work together on the thing—the pilot, copilot, all the table men, all the sensor operators. And when it would work as a machine, the reward was hitting the truck, then you would see it hit and you would see it explode and you would say, 'Super!' Everybody would because you could see what you were doing."[17]

The AC-130's purpose and identity were most closely tied to its armament. The earliest AC-130s called "Plain Janes" by their crews had 7.62 millimeter miniguns and 20 millimeter cannons.[18] The small miniguns were the same as those that equipped the AC-47 and their limited range, penetration, and destructive potential limited their utility to firing on troops.[19] The twenty millimeter had more destructive potential, but more often damaged trucks, which the PAVN operators subsequently repaired.[20] The forty millimeter cannon (first fielded on "Super Chicken" in October 1969) fired clips of four rounds and had a more powerful impact, able to destroy a

---

[17] Lt Col Stephen J. Opitz, interview by Lt Col Robert J. Zimmerman, July 18, 1975, 40-41, Air Force Historical Research Agency, Maxwell AFB, AL.

[18] Knecht, interview, 31-32.

[19] AC-119 vice wing commander William Fairbrother observed that "the 7.62's weren't too good on the trucks. They wouldn't work well at all. But when we got the 20 millimeter guns, they were very effective. Then the AC-130 went on to 40 millimeter, 105 millimeter guns. One of the things about [that was] that you were able to shoot from up higher and [there was] less chance of picking up a lot of that ground flak." Brig Gen William H. Fairbrother, interview by Martin J. Miller and Joseph A. Ventola, 15, Air Force Historical Research Agency, Maxwell AFB, AL.

[20] In a test conducted near Saigon in 1971, Sensor operator Henry Zeybel hit two trucks with twenty millimeter shells and assessed them as "damaged." Upon landing, he was disappointed by actual results. "The ground around the last two trucks was strewn with unexploded 20-mm high explosive incendiary (HEI) shells.…Fist-sized dents covered the trucks like vehicular pockmarks. A few shells had gashed the hoods without producing visible damage to the engines. With new tires, both trucks might have been operable." Lt Col Henry Zeybel, "Truck Count," *Air University Review* (February 1983): 7.

truck with a direct hit.[21] Initial combat testing over Laos found the aircraft twice as effective as the Plain Janes, and Seventh Air Force declared it the "single most successful truck killer in SEA [Southeast Asia]."[22] The last version of the AC-130 fielded during Commando Hunt VII featured a 105 millimeter cannon adopted from the Army, which delivered greater standoff and destructive power.

Crews verified truck kills on their video screens captured by early video recording equipment.[23] This capability became increasingly important as gunships steadily racked up impressive—but seemingly impossible—truck scores each night. Video verification, and changes to counting rules attempted to differentiate between trucks damaged and trucks killed. After seemingly incredible initial successes, Seventh Air Force intelligence required trucks to explode or burn to count as a kill. William Hartman voiced his frustration over kill rules and the controversies the changing rules generated. "The rules that were given to us by 7th Air Force said that if you hit a truck with a forty millimeter shell, it was considered destroyed. If you hit one mil low it was considered damaged. Then if you hit it with the 20s, it was considered damaged if you had a direct hit. If it exploded or burned, then you had a destroyed." As the rules changed, some gunship crews believed their integrity was being questioned. "We, the 16th, were sometimes blamed for [inaccurate reports], but we hadn't set the criterion in the first place. We were reporting the results that we saw and scored it according to these rules."[24] To gain assurance in the truck-kill claims, Seventh Air Force set up a test against eight trucks near Saigon at Bien Hoa

---

[21] Knecht, interview, 41-42.

[22] Ballard, *The Development and Employment of Fixed-Wing Gunships, 1962-1972*, 130.

[23] Early Plain Jane gunships lacked the recording capability and a navigator operating the night observation device (NOD) visually assessed and tallied truck claims. Zeybel, "Truck Count," 2.

[24] Hartman, interview, 33.

Air Base in May 1971. With General Lucius Clay, the Seventh Air Force commander observing from a bunker, a gunship crew flew over from Ubon and performed brilliantly, scoring hits on all eight trucks. From the air, the exuberant crew scored the mission at five destroyed and three damaged, but once on the ground the crew was crestfallen. Their gunfire destroyed only two trucks and damaged five. One truck, believed killed, was actually drivable. "It looked as if number five would be operable. The keys were in the ignition. The navigator climbed aboard, started and raced the engine; it sounded healthy. He shifted into gear and drove fifty feet on flat tires while the rest of us wished the vehicle would die. The sixth truck, on which we had scored a single direct [forty millimeter] hit, was unharmed except for a nine-inch hole through its quarter-inch, corrugated-steel bed. Even the tires were intact. The truck could have been driven to Hanoi." This test validated the need for the most stringent counting rules for the next dry season in Commando Hunt VII. A truck would have to burn or explode to count as destroyed and, in the eyes of one officer, "crews were expected to hit trucks several times in an effort to make them burn."[25]

Seventh Air Force's scoring rules provided incentives for killing and motivated aircrew actions. To get credit for a truck kill, gunship crews fired thirty to forty or more rounds to satisfy the counting rules and to ensure that the truck could not be reconstituted.[26] Although these rules had a powerful and desirable motivating effect on the crews, they could also lead to non-productive behavior. Fire control officer George Hall voiced frustration over the kill criteria when the 105 millimeter gun was first introduced in Commando Hunt VII, and he had a mission where it disabled a truck without igniting it. Gunship leaders were eager to prove this impressive new

---

[25] Zeybel, "Truck Count," 6-7.

[26] Hartman, interview, 40.

weapon's effectiveness. Hall's operations officer directed him to get some kills with the 105 to prove the weapon's utility: "we got out there and found a single truck and we started firing 105s. The AAA was really bad. We had two breaks" to dodge antiaircraft fire, but Hall's crew doggedly lobbed shell after shell despite the risks, well beyond what was useful and prudent to get credit for a kill. "I guess I dug a damn trench around that damn truck, because I remember I spent 26 rounds of 105s, and I never hit the damn truck. I came within ten feet of it, maybe ten times, but I never hit the truck. The whole crew was frustrated."[27]

Seventh Air Force tied decorations to truck kills for the AC-130 crews. After the 1969-1970 season, any crew that destroyed or damaged twenty five trucks in the face of moderate ground fire warranted the award of the Distinguished Flying Cross (DFC). The huge truck scores amassed in 1970-1971 led to multiple awards for many gunship aircrews. According to Henry Zeybel, "a few individuals had DFC oak leaf clusters numbered in the teens." Distinguished Flying Crosses were prestigious medals (falling between the ubiquitous Air Medal and the exceptional Silver Star), and their profusion among gunship crews sparked some controversy with fighter crews who had far fewer opportunities for such recognition.[28] There was also informal recognition that reinforced the gunship's killing mission through the mission videotapes. George Hall recounted "if you had something spectacular, you would get an ammo truck or something like that, a real big explosion or something, then you could tape this stuff and designate it as possibly 'the best of the week.'" Intelligence then compiled "small segments of the missions of particular targets and spectacular type targets and….they were sent back to the states to different

---

[27] Hall, interview, 34.

[28] Zeybel, "Truck Count," 4.

areas." Although he believed the footage served as propaganda, "we were proud of it. If your crew got 'best of the week,' it meant you had a good target. It was pretty productive that way."[29]

The truck-killing mission posed few psychological problems for the crews because they saw their mission as one waged primarily against materials rather than men. Crews that killed enemy combatants were benefitted from emotional and physical distance afforded by the language they used to describe their enemies and the indistinct images of men visible on their video screens. Gunship technology diluted any individual responsibility in kill, since the functions needed to kill a truck or a man were subdivided across the aircraft, making killing a collective act.

Crews could view the vast majority of their actions as a war against material, and truck counts carried none of the potential emotional baggage attached to a body count. Fire Control Officer William Hartman described his gunship's attacks in mechanical and clinical terms: "we hit the truck and part of it disappeared. There was no explosion, just the splash. When a shell hits a hard surface, it splashes. When it hits a road, it just spreads out….We continued to shoot at what was left of the truck and got some hits on it but could never get it to burn."[30] Although gunship crews acknowledged the tenacity of PAVN drivers and mechanics, they seldom went against the people, whom they almost invariably called "gomers."[31] Gomer, as a generic term,

---

[29] Hall, interview, 39-40.

[30] Hartman, interview, 39.

[31] Pilot Kenneth Negus captured this sentiment: "I think he's got some of the finest mechanics and ingenious young country boys that know how the hell to make a truck work that you'll ever find.… when we went out and we damaged a truck…the Gomer was a little bit mad but he could still drive the truck." Negus, interview, 80.

created emotional distance by degrading the adversary; as a gunship-specific term, it stood for "guy on motorable enemy route"[32]

Sensors were able to only indistinctly see people on the ground, but gunship crews were able to see that once under attack, PAVN drivers normally abandoned their vehicles and hid until after the attack.[33] Pilot Ken Negus recounted that with the AC-130's sensors "You could see people running away from trucks and things….You couldn't see their legs, you know, or anything like that, but you could see a little blob moving away from the truck."[34] Steve Opitz had the best vantage as a fire control officer and described that upon spotting a vehicle, he quickly put a round into the vicinity. "As soon as you do that, they know who's up there and they get out of the truck." For practical purposes, a stopped vehicle was far easier to hit; the psychological benefit was that crews did not have to grapple with their consciences if the drivers ran away. "They bailout and run and either man a gun, if one is in the area, or just go hide or run like hell down the road. You can usually see them." Focused on destroying trucks, Opitz noted that crews spent little time on the drivers: "they were hard to hit and normally you didn't go directly after the men because you'd lay so much ammo on the area usually you would hit the area pretty good."[35]

---

[32] Algeo and Algeo, "Among the New Words," 240.

[33] Although most drivers reacted to gunship fire by halting and running for cover, Hanoi lionized drivers who drove through gunship attacks, exemplified by this account published during Commando Hunt V. "Suddenly there was a bolt of lightning ahead. Dirt, rock, and bomb fragments rained down around the vehicle. Thuan twisted his hand and felt light headed. The vehicle rocked back and forth and then dropped forcefully down on the surface of the road and slowly proceeded. 'They bombed in front of me but we will keep going' Thuan thought to himself. The sound of the bombs died away and AC-130 aircraft again arrived firing 20 millimeter rounds along the road, making a noise like a barking dog." Xuan Hoi, "Resolutely Charging Forward on the Roads—Hurricane-Like Attack Power," *Quan Doi Nhan Dan*, February 24, 1971.

[34] Negus, interview, 116.

[35] Opitz, interview, 12-13.

Ken Negus was eager to get drivers to stop and had his illuminator operator throw out ground flares to both orient the gunships crew and to alert PAVN drivers. "I hoped that another thing it would do would be alert the enemy that we were in the area and get him to stop the truck. Lots of times these guys would try to run. They'd just drive like a son of a gun down these pitch black roads. They had a lot of intestinal fortitude, but we ran a bunch of them off the road and off the cliffs and I'm sure killed a bunch of them just because they tried to run." Negus recognized the contradiction of this situation because the real problem was the resolve of the drivers below. "He drove them without radiators. He drove them without windshields or seats, a big log in there to sit on, or anything he could to keep those damn trucks moving." In retrospect nearly a year after the conclusion of Commando Hunt VII, Negus reflected "I just think we just badly underestimated his desire to win that damn war and to do what he had to do to do it. I think we completely misaimed our effort at damaging and destroying and interdicting when we should have been destroying *everyone* we could, not damage and leave it."[36]

Gunship crewmen could draw psychological support from the presence of their peers in actions that could only be the result of a collective effort by the entire crew. Author Dave Grossman argues in *On Killing*, that proximity to a group that one respects and identifies with (like a gunship crew) provides absolution and anonymity in a collective act of violence that one might not otherwise take as an individual.[37] Actions taken against men and women along the Trail were the aggregation of an entire crew's efforts. Each man had only a small part of the action that combined to comprise a kill. Sensor operators found targets, the FOCO coordinated the actions of the sensor operators, the navigator ensured the target was in an allowed target area, the gunners

---

[36] Author's emphasis. Negus, interview, 24-25, 81.

[37] Grossman, *On Killing*, 149-155.

loaded the cannons, and the pilots aligned the guns with the sensors. These mutually reinforcing actions combined the actions of the entire crew and distributed the responsibility of any action, limiting the individual responsibility, and potential regrets, of any single airman on the crew.

The Air Force's first gunships were designed with an anti-personnel mission in mind. Three different gunship models took to the air over Southeast Asia and all had a powerful anti-personnel capability resident in their rapid-fire 20 millimeter cannons or 7.62 millimeter miniguns. AC-47 Spookys, first fielded in 1964, proved invaluable in an anti-personnel role supporting troops in contact (TIC) at remote outposts in Viet Nam's hinterlands. AC-47s were based in South Vietnam, and flew primarily in country. More capable and powerful AC-119G Shadow and AC-119K Stinger gunships replaced the Spookys between 1968 and 1970.[38] Seventh Air Force established the AC-119's first three priorities as "close fire support" of 1) friendly troops in contact, 2) friendly outposts, and 3) friendly villages, before interdiction and armed reconnaissance (truck killing) which was the AC-119's fourth priority. The AC-119s flew occasional sorties in Laos, divided between troop support for Vang Pao's Meo fighters on the Plain of Jars in northern Laos and as a supplementary resource over the Trail.[39]

Although the AC-130 had a formidable anti-personnel capacity, its performance, advanced sensors, and more powerful weapons made it best suited for interdiction over the Ho Chi Minh Trail, and Spectres participated in relatively few troops-in-contact (TIC) missions of the sort that so motivated the FACs in South Vietnam. During Commando Hunt, Spectres flew a few TIC sorties in support of indigenous forces in Laos, and after 1970, indigenous Cambodian

---

[38] The AC-119G was armed with four 7.62 millimeter miniguns and the AC-119K four miniguns and two twenty millimeter cannons. The aircraft was older, slower, and had poor climb capability compared to the C-130, but was favored by the secretary of the Air Force to save money and C-130 airframes. Ballard, *The Development and Employment of Fixed-Wing Gunships, 1962-1972*, 176-220.

[39] Search and rescue was the AC-119's fifth priority, armed escort was sixth, illumination was seventh, and harassment and interdiction was eighth. Ibid., 193.

forces.[40] The navigators were responsible for locating and making contact with indigenous forward air guides (FAGs) who provided limited ground-based forward air control. AC-130 crews recognized the important role they could play in safeguarding friendly troops, but some were concerned about being pulled from the recognition available in the truck hunt. George Hall recalled that only "occasionally, we would have a TIC, but even those TICs did not involve American troops on the ground, perhaps a FAG [indigenous forward air guide] or something in Laos or in Cambodia, or something up in the Barrel [Barrel Roll—the Plain of Jars]."[41] The lack of American contact may have lessened motivation, but motivation was also affected by the organizational ethos and status derived from truck killing. Flight Engineer Jerald Appleby recalled it was rare to get a call to support TIC during Commando Hunt. "It was unusual. In fact, most of the pilots resented it. They resented the fact of being called in on troops because they couldn't claim trucks destroyed, I guess; somebody [was] trying to be top truck killer."[42]

When gunships made contact with Americans on the ground needing fire support, the motivation and intensity level peaked throughout the aircraft. Even the sensor operators,

---

[40] Although outside the scope of this chapter, AC-130 crew perspectives changed considerably at the close of Commando Hunt VII. On March 30, 1972 the PAVN launched a general offensive against South Vietnam from the DMZ, Laos, and Cambodia. Hard-pressed ARVN units and their American advisors called on all the American airpower available to hold against a PAVN onslaught. The urgent airpower response throughout the theater ended Commando Hunt and signaled a change in mission and attitudes. Seventh Air Force committed gunships to support Vietnamese troops and American advisors on the ground. The AC-130's firepower and accuracy brought an unprecedented capability to bear in the defense of the South Vietnamese city of An Loc. The AC-130's routine accuracy led troops to call in extremely close gunship fire in house-to-house battles. As fire control officer, George Hall had a close-up view of the battle and was concerned about the possibility of fratricide. "We asked what [building] the friendlies were in. He said, 'We are in a building across the street. You are doing fine. We are picking them off as they are running out of the building.' It was quite rewarding….When we got into the area, they cleared any fast movers [fighters]….They would rather have a gunship there than anybody else, because they knew we could hit that particular target and do the job for them." Hall, interview, 8-9.

[41] Ibid., 2.

[42] CMSgt Jerald Appleby, interview by Hugh N. Ahmann and David Metz, January 28, 1988, 84-85, Air Force Historical Research Agency, Maxwell AFB, AL.

encapsulated in insulated their booth felt the intensity. Fire control officer Stephen Opitz directed fire support to a beleaguered outpost. The American advisor called in extremely close cannon fire, pleading "lay it in the wire; lay it in the camp….[then] Great, great! There are pieces of people flying all over!" Opitz said "Oh Jesus" and reflected "that's when you think about killing people. You're in such a sterile environment in the booth. There are TV sets, infrared sets, consoles, tape recorders; you're all dressed up; you're in an air-conditioned, almost soundproof booth, and it's like you're working out of a control panel place. You really don't get the feeling that those guys do with the smell of the dirt." Outside the booth, the experience of battle was much more visceral. Opitz continued that "every mission I would go out, and I stand in the back of the bird and it would be a completely different environment—wind, engine roar. You could smell cordite, and you would look down and you'd see fires. It would be a little more realistic, but you could relate to these guys in the problem they had. So we laid it in on the wire….and evidently we were effective."[43] AC-119K gunner Howard Fackrell related the intensity and emotion of a close troops in contact battle from the gun bay. "The excitement started my adrenaline pumping as we heard our navigator make radio contact with the Marines who were yelling for us to start shooting as the bad guys were closing in on them. The navigator asked how close are they—we didn't want to have a 'short round incident' and shoot some of our troops." The emotion of the troops on the ground amplified the intensity of the situation for the gunship's entire crew, even the men in the gun bay. "The Marines yelled 'who gives a rat's ass, one way or another we're dead—start shooting!'" To Fackrell, the emotional intensity matched the physical intensity of the battle. "The barrels on our mini-guns got red hot—you could see them glowing—and you had better not touch them when you went to re-load...I do remember that we expended all 20,800 rounds of our

[43] Opitz, interview, 38.

ammunition, and then started dropping flares, lighting up the jungle as the choppers came in to evacuate the Marines and return then to Da Nang with no causalities. Boy, that was one good mission and made it worth while [sic] being in Vietnam."[44]

Radio conversations between the gunship crews and Americans on the ground established a motivating bond between airman and soldier, and spurred gunship crews to their utmost efforts. Stephen Opitz assessed direct communications established a "connection between flying and people on the ground [that] kind of sinks home, really makes you help." In some situations, especially during the Easter Offensive of 1972, gunship crews became personally attached to individual American ground controllers for days and weeks. Controllers with the call sign Zippo and Tunnel were AC-130 crew favorites during the battle of An Loc.[45] These personal linkages engaged the crew's emotions in an otherwise sterile and detached technology bubble. Opitz's crew was frustrated with their inability to destroy a tank attacking a ground unit they were talking to. "You could hit a tread. We thumped that thing for a while, and the radio went quiet, and I guess we lost that fire base….Son of bitch…We are going to get them. You stay there as long as you can, and you really get right down on fuel, and you hate to go home. You are taking AAA, and people are shooting at you, but you think—God you want to kill a tank; *you want to get even*."[46]

After the Commando Hunt VII and Easter Offensive battles subsided, AC-130s worked frequently in South Vietnam but their support of outposts became less interesting without the intensity or connections made during troops in contact. George Hall voiced frustration with

---

[44] Fackrell, "The AC-119K Gunship Program Vietnam--My Second Tour," 9.

[45] Hall, interview, 10-11; Opitz, interview, 32.

[46] Opitz, interview, 35.

outpost support because he doubted their utility and the efficacy of their attacks similar to the frustration felt by Arc Light's B-52 crews. "We would identify the outpost and then ask him for targets, and normally his targets would be out in the boonies somewhere, maybe a thousand meters west. Then we would start firing out there…these weren't very good missions because you were just firing in the boonies, a group of trees—you couldn't see really an identifiable target down there." For a community accustomed to instant feedback from video images of destroyed trucks or radio calls from troops in contact, mundane fire support in South Vietnam was a low payoff mission: "there was usually no feedback of what you actually accomplished through this method. You couldn't actually see anything from the gunship either. The An Loc mission you could see things."[47] Gunship crews found monkey killing and matchstick making as dissatisfying as the B-52 crews did.

Authority: "We Had the Run of the Trails"

Throughout the Commando Hunt campaigns, gunship crews enjoyed considerable autonomy and voiced few frustrations with higher headquarters direction or interference. On the aircraft, there was an informal system of distributed leadership divided between the navigator, fire control officer and the pilot. These three aviators collaborated during preflight to develop a plan to hunt for trucks within their allocated sector. William Hartman was the squadron's senior fire control officer and described the autonomy his crew enjoyed in deciding how to best rove their allotted airspace and hunt trucks. You would "look at any changes that might have come through in the frag, decide on how you were going to fly it, because you were assigned to an area out in Steel Tiger east, and one gunship into that area. So you would decide how you would

[47] Hall, interview, 20-21.

navigate to that area and how you would work the area once you got there."[48] He noted that once his crew gained experience with an area, they developed very effective tactics. "One week we got to fly to the same area five times. That was tremendous because we knew that thing by the fifth night like the back of our hand. We knew exactly what the truck pattern was and everything.…We'd know that area cold by the fifth night. Those were usually when we got a lot of truck kills."[49]

The table navigator had primary responsibility for aircraft position throughout the mission, to avoid restricted areas, and to apply the rules of engagement which were often expressed in terms of ground features and sectors. The fire control officer directed and coordinated between the sensor operators, and selected which would provide input to the aircraft steering and navigation. The aircraft commander had overall responsibility for the mission, crew, and aircraft. Aircraft commander Kenneth Negus believed this mandated extra preparation and anticipation to get the crew organized and on track so that he could monitor their performance and supply decisions when needed. "I found that in order to be successful at what I was doing I had to start very, very early in the program and had to stay well ahead of what was going on all the way through. I generally had to work a little extra before crew briefing."[50]

Once in the target area, the aircraft commander flew looking over his left shoulder and became almost totally dependent on steering and intercom inputs from rest of the crew.[51] Negus believed the pilot "had to know his people pretty well in the back. I think one of the key

---

[48] Hartman, interview, 18.

[49] Ibid., 26-27.

[50] Negus, interview, 17-18.

[51] Fight Engineers, for example, would stand behind the pilot and continually advise him of the aircraft's bank angle so that he could keep his eyes fixed on the sight and aiming reticule. Appleby, interview, 68-69; Knecht, interview, 2.

requirements for an aircraft commander was to be able to recognize voices" to understand their inputs and to enforce intercom discipline within a large crew.[52] The sensor operators and fire control officer tracked ground targets and fed those inputs into the fire control computer which then projected an aiming solution into the pilot's gun sight. The aircraft commander had to perform difficult and delicate flying, maintaining an attack orbit, and precisely align the guns with direction computed by sensors and computer. Once the pilot successfully aligned the aircraft's fixed guns (represented by a fixed gun-aiming cross projected in the sight) with the computed firing solution (represented by a floating cross projected in the sight) he exercised his ultimate authority within the aircraft by pressing the trigger to fire the guns.[53]

During early Commando Hunts, the crews exercised near complete autonomy within their allotted sectors. This appealed to gunship crews, who were able to apply all their experience and intuition and decide how to best hunt trucks. Task Force Alpha, the command and control center for Commando Hunt served in an advisory function and passed on information derived from the sensors implanted along the Trail detecting truck activity. Gary Knecht recalled that "we kind of had the run of the trails" and "we would check all those places out [identified by intelligence], and then we would just go on down the trail."[54] During Commando Hunt VII, Task Force Alpha became much more directive and provided real-time instructions to gunship crews operating within their sectors based on remote sensor inputs and computer predictions. The loss of autonomy frustrated gunship crews who believed they had better information than the officers at

---

[52] Negus, interview, 17, 19.

[53] AC-119 vice wing commander William Ginn stated that although the pilot had control of the guns, it was not due to a philosophical requirement for the aircraft commander to fire, it was simply because he had the sight (which was directed by others on board the aircraft). "The aircraft commander had the sight, and you were putting the sight where he was telling you to put it." Ginn, interview, 31.

[54] Knecht, interview, 46.

the Task Force Alpha facility. Pilot Kenneth Negus also feared a greater danger of midair collisions due to unreliable centralized control. Although Task Force Alpha had improved ground data, it lacked a picture of the situation in the air. "In the 1971-72 dry season, the decision was made to go to a much more, much stricter control of the operations in the area with respect to TFA [Task Force Alpha] advisories. In fact, TFA was put in control of the operating areas.…The basic control of the working area was no longer with the gunship. The basic control went to NKP [ground controllers at Nakhon Phanom Air Base].…We feel that the effectiveness of the interdiction mission really fell a great deal. There were numerous reports of close calls in the operating areas."[55]

Gunship crews, like forward air controllers, had been granted considerable autonomy throughout much of the war, and were frustrated by external control that they believed cut down their effectiveness. This frustration, however did not reach the boiling point that it did in Rolling Thunder. Their relatively detached war against material did not invoke the emotions that led to the fighter's and FAC's boundary-pushing and rule-breaking. The rules of engagement may have been frustrating at times by limiting attacks near Laotian civilians or government troops, but the crews were normally able to work with restrictions and still very successfully carry out their truck-killing mission, exercising their own agency. The irritation with greater centralized control during Commando Hunt did not feature prominently in many narratives during a time that experienced a much greater tension from growing North Vietnamese defenses.

---

[55] Negus, interview, 71-72.

Risk: "They're Not Going to Get Us Because We're Good"

AC-130 crews enjoyed a relatively benign environment in 1968, but as the gunships successes mounted, each successive Commando Hunt season introduced more formidable PAVN defenses. Early gunship technology afforded suitable protection from the cover of darkness, but as defenses increased, these large and inherently vulnerable aircraft were challenged to operate at an acceptable risk. The crews drew on their skills, mission success, and pride to face growing dangers, but ultimately had to surrender the skies over much of the Trail to the PAVN's technologically insurmountable radar-directed guns and missiles in early 1972.

In the early Commando Hunts, the crews believed they could handle the antiaircraft threats through skillful crew coordination and timely maneuvering. From his vantage point on the aircraft's open ramp, illuminator operators scanned the night for muzzle flashes and assessed the direction of rising tracer rounds. Thirty-seven millimeter rounds had a six to seven second time of flight to reach a gunship orbit and could not change direction once leaving the gun barrel. During those six seconds, illuminator operators directed their pilots to maneuver the aircraft to spoil the shot. At the onset of Commando Hunt VII, fire control officer Steve Opitz believed that effective crew reactions made the antiaircraft threat controllable. "We thought we were fairly impervious to being hit by AAA" because of the illuminator operator's warnings. He "would holler at the last minute, 'Break right,' or 'Break left.' And the pilot would turn the bird, break it out of orbit, and the shot would come up relatively close. They would go off and you would hear them and smell the cordite. We hadn't taken a hit for some time….we didn't think Spectres would ever get hit."

Opitz was confident in his crew's agency and skill in dealing with defenses, but he was also ready to overlook two prior AC-130 losses to thirty-seven millimeter guns, one during

Commando Hunt I and a second during Commando Hunt III.[56] During the Commando Hunt III season in 1969-1970, antiaircraft guns scored hits on AC-130 gunships seven times resulting in the loss of one aircraft.[57] The addition of the forty millimeter cannons allowed the AC-130s to operate from higher altitudes and yielded a loss-free Commando Hunt V campaign in 1970-1971. The gunships mounting success however did not go unnoticed and the PAVN deployed more guns onto the Trail for the following year. Some intelligence reports estimated the number of guns doubled from seven-hundred guns to fifteen-hundred between the end of Commando Hunt V and the start of Commando Hunt VII.[58] More alarming still was the increase in the more capable fifty-seven millimeter guns. Compared to the thirty-seven millimeter guns which predominated through 1971, the fifty-seven millimeter guns had a heavier shell with a larger lethal radius, could fire higher, and had a higher muzzle velocity.[59] The muzzle velocity was perhaps most disconcerting to the crews because the fifty-seven millimeter gun's shells traveled more than 10 percent faster, shaving irreplaceable time from the gunship's razor-thin margin between detecting threatening shots and maneuvering the big transport away from the projectile. Crews observed some guns that gave even less warning still and assessed the threat as a more powerful (and faster) weapon. "Then they came in with what we called fifty-seven magnums,

---

[56] Hobson, *Vietnam Air Losses*, 182, 202.

[57] Ballard, *The Development and Employment of Fixed-Wing Gunships, 1962-1972*, 134.

[58] The CHECO Report on Commando Hunt VI assessed that the Vietnamese put many of the antiaircraft guns in place at the end of Commando Hunt V into storage during the wet season. Presumably, the PAVN returned them to service with additional guns in November for Commando Hunt VII. Nalty, *The War Against Trucks*, 215; Capt Bruce Layton, *Commando Hunt VI*, CHECO Contemporary Historical Evaluation of Combat Operations, July 7, 1972, 70, 75, Air Force Historical Research Agency, Maxwell AFB, AL.

[59] Less than 10 percent of the antiaircraft guns deployed during Commando Hunt VI were fifty-seven millimeter or larger. Thirty-seven millimeter guns were most numerous, followed by even less capable twenty-three millimeter guns. Layton, *Commando Hunt VI*, 75.

things that would light off and you'd barely have time to break. Usually we had 5 or 6 seconds. Some nights the illuminator operator would call 'AAA, watch it!' And one, two seconds and the stuff was up and by us. So the only thing we could figure, they had newer ammunition… what we called magnum 57s. But not too much."[60]

The 16th Special Operations Squadron's confidence was rattled when a gunship took a fifty-seven millimeter hit at the onset of Commando Hunt VII in November 1971. The shell hit underneath the booth, mangling the infrared operator's legs and blowing a gaping hole through the belly of the aircraft. The infrared operator was saved from falling out of the hole by the actions of his horrified partners in the booth. According to Opitz, this "was the first hit of Commando Hunt VII in our squadron and it made quite an impression on us."[61] On his first mission after this hit, Opitz used humor, peer pressure and a reminder of the crew's agency to cope with their fears. When the illuminator operator called out approaching antiaircraft fire, "I was sitting in back of the booth and there were four other guys in there and all of us pulled our feet up off the floor. Just kind of got all scrunched up, tucked them up under our seat, and I could see people getting smaller." When the crew dodged the round, Opitz broke the tension: "'Okay guys, let's put our feet back on the floor and go to work.' We all got a laugh because I think everybody in the airplane was just that uptight. And then it was business as usual. Hell, we felt good again. Hell, they're not going to get us because we're good."[62] The crew's skill, however, began to fall short as increasing numbers of guns poured into Laos and gunners began to fire in barrages from multiple quadrants.

---

[60] Opitz, interview, 10.

[61] Ibid., 6-10.

[62] Ibid., 8-9.

Seventh Air Force reacted to the growing anti-aircraft threat with additional daytime fighter sorties dedicated to anti-aircraft destruction, and fighter escorts for the gunships at night. During Commando Hunt VII, Seventh Air Force increased daytime reconnaissance and fighter sorties (armed with laser-guided bombs) dedicated to attacking antiaircraft guns. But these missions scored minimal successes, claiming destruction of only thirty guns. Seventh Air Force also sustained fighter escort support detailed to each gunship from 1969 to the end of the operation.[63] Three F-4 Phantoms teamed with each AC-130 and rotated coverage between their assigned gunship and KC-135 tankers for fuel to cover the entire three to four hour gunship patrol. When working with the gunship, the fighters circled overhead ready to dive on guns when directed by the gunship pilot.[64] In 1970, Gen George Brown, the Seventh Air Force commander did not share the gunship crew's optimism and believed that the AC-130s were so vulnerable that they could not operate without fighter support. "In that environment their work is only made possible by the F-4s. If you don't have the F-4s, those gunships aren't going to work."[65] The gunship crews appreciated the support, but were unimpressed by the fighter's performance. Gunship crews had the benefit of sophisticated sensors to assess the F-4 escort bombing performance, which gave them a dismal view of the F-4 accuracy. Stephen Opitz used the sensors to provide feedback: "poor F-4s—those guys really never saw anything. They would say, 'How did we do Spec[tre], how did we do?' You hate to tell a guy he missed."[66] Gary Knecht believed that the F-4's inaccuracy at night relegated them to a suppression mode rather than a destructive

---

[63] Knecht, interview, 35.

[64] After February 1969, Gunship pilots qualified as forward air controllers by attending a FAC course at Ubon. Ballard, *The Development and Employment of Fixed-Wing Gunships, 1962-1972*, 113.

[65] Brown, interview, 77.

[66] Opitz, interview, 40.

one. “To be honest with you, as far as I know they never hit [a gun] but they would get close enough to scare them, and that shut them up. That is all it was. Suppression is all they were there for. We were more accurate in blowing it up than they were if we could pinpoint the damn thing.”[67] Kenneth Negus appreciated the F-4s for their willingness to draw fire from the gunships: “I really think that the guys that flew the F-4s have to be handed a fantastic accolade….Man, I saw guys go down into that damn AAA with their lights full blazing, you know—[like a] Christmas tree…dragging that fire away from the gunship. Now, hell, that’s mission oriented.”[68] Like pilots who supported troops on the ground in South Vietnam or fighter crews like Ralph Parr and Tom McManus who flew into considerable danger to clear a path for C-130s into Khe Sanh, these F-4 crews likely felt responsible for the safety of the AC-130 crews. These bonds between fellow aviators provided a greater sense of purpose than a routine attack mission. The F-4 crews were also likely to have believed that they were more able to accept risk in their fast and maneuverable fighters compared to the slow-moving gunships, and exposed themselves to fire for the sake of their larger and more vulnerable partners.

F-4s equipped with laser-guided bombs proved to be far more effective in countering anti-aircraft guns and destroying trucks with their two thousand pound bombs but limited availability hampered their overall effectiveness. The AC-130 low-light TV had a laser-designator that allowed it to mark targets for fighters carrying guided bombs, but small numbers of weapons and other targeting priorities limited opportunities for cooperation. After the initial laser-guided bomb combat test in 1968, limited numbers of laser-guided bombs became available. In 1969 Seventh Air Force averaged 133 laser-guided bombs per month, with the bulk allocated

---

[67] Knecht, interview, 35-36.

[68] Negus, interview, 52.

for road cuts.[69] Ken Negus assessed that "we really missed the bet in using the laser-guided bomb with the gunship. The times that we did use it, it was very effective, extremely effective. The only reason that I can give for the fact that we did not get more LGBs assigned to the gunships we generally had an [LGB equipped] F-4 up in the operating area" but "we might have ten gunships at any one time in the operating area, and one [F-4 with LGBs] is nowhere near adequate to service ten gunships."[70]

The PAVN introduced SAMs into Laos in late 1971 and on March 28, 1972 scored a hit on Spectre 13. Ken Opitz witnessed the loss from an adjacent sector. "Our copilot said, 'Holy Christ, look at that.'…I ran out the booth, just to see out the gunner's port and it was big orange flames. I guess it looked like the size of a football field just arching down the sky. Not a soul survived…They were loaded with fuel and it turned into a big orange ball."[71] Over the next several days, Opitz narrowly dodged a second SAM fired from the same area and on March 30, 1972, Spectre 22 went down, hit by fifty-seven millimeter gunfire. Miraculously all crewmembers bailed out before the aircraft exploded and were plucked from the Laotian countryside in an extensive search and rescue operation the next day nicknamed the "Great Easter Egg Hunt." In response Seventh Air Force determined it would be unable to roll back the defenses to establish a permissive environment for gunship operations and pulled the gunships back from northern sectors of Commando Hunt ceding the battlefield to the PAVN.[72]

---

[69] Porter, *Second Generation Weaponry in SEA*, 21-39.

[70] Negus, interview, 55.

[71] Opitz, interview, 24-25.

[72] The gunships were unable to defend against the radar-guided SA-2s. Inherently vulnerable in a low and slow aircraft, the AC-130s lacked capable electronic countermeasures, chaff, and flares that equipped the B-52s. The AC-130s also lacked the Wild Weasel support that SAC demanded for the B-52s (even though two to three times as many lives were at stake in each gunship). These two losses came at a watershed moment. On March 30, the PAVN launched the Easter Offensive along multiple fronts in South Vietnam.

Risk-mission tension increased throughout Commando Hunt for the gunship crews. The crews counteracted first with their own agency through increased vigilance and maneuvering to dodge antiaircraft rounds. As the North Vietnamese capability increased, crews had to begin to trade mission effectiveness away to manage the risk by increasing gunship operating altitudes. Higher altitudes meant less sensor resolution and lower hitting power from the Spectre's weapons. Visionary Air Force engineers in the States helped mitigate that tradeoff by pushing for larger, more capable guns (first the forty millimeter, then the 105 millimeter) to help create greater standoff range.[73] But altitude still robbed effectiveness. The first AC-130 gunship deployment used a 5,000 foot operating altitude, then a 7,500 foot altitude, which eliminated the effectiveness of the 7.62 millimeter miniguns.[74] The appearance of small shoulder-fired SAMs in 1972 pushed the gunships higher still to 9,500 feet. Crews believed that the shift to 9,500 pushed them to their physical limits in an open and unpressurized aircraft. George Hall expressed the frustration Gunship crews experienced as the defenses pushed them higher. "We really hated to swap altitudes with our mission. We couldn't go up beyond 9.5 [thousand feet] much and really work because of the oxygen factor and so forth."[75]

Support from other escorting fighters may have helped suppress antiaircraft guns, but it fell short of necessary performance when the PAVN proved willing to saturate the Trail with big guns. F-4s equipped with unguided bombs lacked the accuracy to kill the gun emplacements at night, and lacked sufficient quantity of laser-guided bombs in Commando Hunt VII to roll back

---

The resultant theater-level crisis mandated a near complete shift of effort from interdiction in Laos to close air support in South Vietnam.

[73] Ballard, *The Development and Employment of Fixed-Wing Gunships, 1962-1972*, 126-127.

[74] Knecht, interview, 32-33.

[75] Hall, interview, 11, 26.

the defenses. When the SAM threat, suspected by intelligence to be lurking in Laos surfaced at the end of April, Seventh Air Force ceded the battlefield due to the immediate and higher priority in-country problems posed by the Easter Offensive.

Motivation: "I was Proud of What I was Doing"

Gunship crews came to the war believing they had an important mission and a unique technological capability to successfully accomplish that mission. Technical advances put the power to see through the dark and aim rapid-fire cannons against otherwise unseen enemies below. This unique power and the freedom to use it, as crews thought best, was motivating; gunship crews correctly believed that they were solely able to execute the difficult mission of finding and destroying trucks at night. Although crews came with a variety of initial motivations to this new and impressive weapons system, their expertise in accomplishing their mission, and the institutional praise they earned as the theater's best truck killers spurred them to action.

Gunship units in Southeast Asia were manned by a large cohort of highly seasoned aviators augmented by a smaller cohort of more junior copilots, scanners, and gunners. An AC-130 flight engineer recalled that during his tour at Ubon, the gunship squadron was so top heavy with experience it had forty-two lieutenant colonels—in a unit normally run by two or three lieutenant colonels.[76] Some aviators were attracted by the gunship's exotic technology and mission; others were assigned through the personnel system's machinations as it scoured the Air Force's pilot and navigator ranks to fill cockpits under the one-tour policy. Many senior field grade officers, already at retirement age, returned to flying as pilots, navigators, and sensor operators in gunships. Some were daunted by returning to a cockpit, but narratives indicate a genuine enthusiasm for the gunship developed during initial training.

---

[76] Appleby, interview, 78-79.

Lt Col John Rose was recalled from the staff to the cockpit of the C-47 in 1967 and summarized his experiences as an "over forty steeldesk jockey" tasked to return to the cockpit. "Naturally there is a certain amount of reluctance to go back twenty years or more and do what we all did when we were kids." Rose found he quickly regained his flying confidence after years away from flying. "We see now what was meant by a pool of flying talent that could be tapped when needed and would be readily trainable to fill combat flying roles not normally needed in peacetime. Here we are, friend, hundreds of us doing just that! ... It's a long road from desk to left-seat Goon duty in Vietnam—attitude is everything. Just like thunderstorm flying, if your attitude is right you'll come out the other side and the sun will be shining!"[77] Rose's peers, many sent to the newly-formed gunship units, likely had similar experiences as they returned to the cockpit during Commando Hunt.

Several experienced aviators were handpicked by their superiors to participate in the gunship's new and unique mission. Steve Opitz was a highly seasoned airlift navigator when his boss got him an assignment from the Pentagon into gunships. "'You'll really like [your assignment]. It's a really shiny one.' And I said, 'Well, define shiny?' He said, 'Well, that means you're going to get a lot of medals.'" A father of five, Opitz wasn't sure he wanted a crack at medals but was pleased with the assignment, and found it "quite rewarding."[78] Flight engineer Gary Knecht's supervisor pushed him towards gunships from straight C-130s due to his aggressiveness: "I'm going to give you first crack at [a gunship assignment] because you are the one who has been taking all the flights trying to get ahead. Also, it will get you some SEA

---

[77] "Goon" was an affectionate contraction of Gooney Bird, the popular nickname for the World War II vintage C-47 Skytrain. Lt Col John G. Rose, "The Rosy Road to Vietnam," *Air Force Magazine*, December 1966.

[78] Opitz, interview, 2.

[Southeast Asia] time."[79] Loyd King had been a C-130 pilot for seven years when he transitioned into AC-130s. "I didn't know what the gunship was all about until I arrived here, but I found it fascinating." Opitz, Knecht, King and their fellow aviators assigned to gunships, were already confident in themselves due to their experience, and they quickly gained confidence in their aircraft, which impressed them with its cutting edge technology, reinforcing their initial motivations. In the words of Lt Col King, "I'd have to say I was pretty well motivated because I did find the gunship a fascinating system."[80]

Gunship crews, like other American aviators, acknowledged but downplayed ideological motivations. When asked, a young AC-119 copilot recalled that he never brought up political climate back in the States when communicating with his family. "We didn't talk about that at all. It was just practically every other thing except that."[81] William Ginn served as director of operations in AC-119 and AC-130 units, and expressed a common sentiment on the basic policy behind the war during Commando Hunt: "all we are saying is that the people in the South have a right to self-determination. It is not a civil war internally. It is people invading from the North. Until you stop invading; until you cut off the flow of supplies and men down there, we are going to punish you."[82] For most, this perspective was good enough to justify being there, as other more powerful forces provided these aviators with the motivation to risk their lives over the Ho Chi Minh Trail and destroy PAVN truck convoys between the fall of 1968 and spring of 1972.

---

[79] Knecht, interview, 17.

[80] King, interview, 2-3.

[81] Fred Wayne Boling, interview by Kim Sawyer and Stephen Maxner, November 16, 2000, 26, The Vietnam Archive, Texas Tech University.

[82] Ginn, interview, 35.

In combat over the Trail, AC-130 gunship crews drew motivation from their mission, their unique competence in that mission, and the recognition that they earned through their mission successes. By operating the AC-130's unique and leading edge technology, gunship crews became the most effective truck-killers in the theater. Their sustained excellence in completing a dangerous and challenging aviation task provided them with the motivation to hunt the enemy over southern Laos every night throughout successive dry seasons. Since the PAVN drivers hid from American fighters in the daytime, and fighters lacked the gunship's sensors to penetrate the darkness, only gunship crews could deliver the nightly truck victories so desired by Seventh Air Force. Crews knew they were being incredibly successful because they could observe the destruction of trucks through their multiple sensors. This evidence of success in a difficult and challenging task provided gunship crews with the motivational feedback that was so lacking and frustrating to B-52 crews during Arc Light, and most of their fighter crew partners in Commando Hunt.

Some aviators questioned the impact that night interdiction of truck traffic was having on the war. William Ginn doubted the utility of interdiction along the Trail while the concentrated transportation hubs in Hanoi and Haiphong were kept off limits. "It doesn't make any sense to swat flies if you are going to leave the screen door open. You can't attrite an enemy in which, in theory, the Chinese can march four abreast off a cliff and never stop."[83] Despite his own personal doubts with the imperfect strategy, Ginn and his fellow gunship crews believed that their mission was an important one. Their training and equipment made them the only ones capable of accomplishing that mission. When he directed AC-119 operations, Ginn advocated to a visiting general that "there is only one airplane that can see at night and can hit what it can see. That is the

---

[83] Ibid., 34-35.

-119…The F-4s couldn't do that" and even working with a FAC and flares, "it was just not a good truck killer; and the gunship was, no question about it."[84]

Gunship crew's confidence in their aircraft and their own skills could dim their perceptions of the dangers that gradually escalated through successive Commando Hunt campaigns. As the mission vs. risk calculus tilted steeply towards the PAVN's defenses throughout Commando Hunt VII, crews confronted substantial motivational challenges to face powerful defenses in a large vulnerable cargo aircraft. Crews mitigated the tension they felt through their own skills, luck, humor, teamwork, and belief in their mission's relevance. Gary Knecht, with the AC-130 from the start, said he felt like a sitting duck "every night," but he believed a combination of luck and crew proficiency got him through two gunship tours without taking a hit. "I was probably very, very lucky; but I felt we had pretty good chances. That depends on the crew."[85] Gerald Appleby noted that crews had a variety of talismans to keep them from tempting fate. "We had apes, bears, turkeys; we had a zoo…and every crew had their own little thing that they carried. When I went back over there, we were flying hard crew. All we ever carried was a rubber duck that we set up on top of the APN-59 repeater scope, and it flew all the missions."[86] Humor played a role in coping with the stress of combat. As already noted, Ken Opitz used humor to relieve the stress the sensor operators felt when they came under fire, as he pointed out they could all put their feet back on the floor. He also related a more premeditated use of humor over the Trail. Opitz noted that his crew experienced "a lot of tension, and you burn it up with creative ideas." His crew bought a pig, put it in a custom-fit flight suit filled with letters

---

[84] Ginn, interview, 28.

[85] Knecht, interview, 41.

[86] Appleby, interview, 77-78.

thanking the gunners for their inaccuracy and dropped it by parachute it on a very tough anti-aircraft concentration near Tchepone, Laos. "Hell, if you didn't do that, you just can't live in that kind of terse, tense environment all the time without a sense of humor, and the crews had a good sense of humor, not always authorized, but we had some fun out of it."[87]

This sort of action, although unfortunate for the pig, could build a sense of cohesion within a gunship crew, which in turn, could bolster motivation in combat. When gunship commanders elected to schedule the same crews together, solidarity increased within the crew. Fred Boling flew as an AC-119 copilot and although his squadron did not use fixed crews, "there were some situations where you started flying with some crew members and were able to keep that component going for a week or thirty days at a time. I enjoyed that because it gave you some camaraderie with your crew members."[88]

Spectre crews were willing to try a stunt like the pig drop because they drew self-confidence from their aircraft. Like the parochialism and partisanship demonstrated by Rolling Thunder's fighter pilots, Spectre crews' confidence could result in overly optimistic self-deception. William Hartman (who completed his tour of duty during Commando Hunt VII before the two gunships were lost) was reassured by the AC-130's armor: "They came back. I saw recently photography of an E model that had been hit squarely in the bottom of the airplane, right underneath the twenty millimeter storage, but they've got armor plating in there. All they did was crack the armor plating and tear out some skin and some ribs and the airplane came home with no problem. So, coming home with holes in the airplane was kind of common. Sometimes the airplanes did come back with some pretty severe damage. But they had a team of people over

---

[87] Opitz, interview, 51-53.

[88] Boling, interview, 13.

there to rebuild the airplanes."[89] Stephen Opitz (in a 1975 interview) only recalled early gunship losses (before Commando Hunt VII) with prompting by his interviewer. "I guess in 1971, they took a couple of good [antiaircraft hits]…but nothing you really ever heard about." Opitz endorsed self-deception. "I guess it was a good idea not to broadcast those kinds of things. Because all it does is demoralize people and scare them. For all practical purposes, it was the first hit of Commando Hunt VII in our squadron…[that] made quite an impression on us."[90]

Most importantly, Spectre crews filled a role they thought was important, which took all their skills, and they were delivering impressive visible and measurable results that both crews and headquarters could agree on. The risks encountered in Commando Hunt VII created tension, but gunship aviators mastered their fears and returned to the Trail every night. Stephen Opitz "never saw a guy chicken out; never saw anybody get squeamish. You would grumble and say, "Christ, I don't want to go in that area again. You worried about it when you were in Intel," but he believed that the mission kept him engaged. "You know three airplanes are lost. You know SAMs have been launched at you. You worried about it but then, as soon as you got in the bird and started doing your job, you didn't think about it. They would be shooting at you; you'd be breaking, but you were so concerned about your equipment and doing the job right you never really worried about getting hit."[91]

Like crews from other aircraft types, gunship crews became consumed with their mission tasks which supplied them with motivation in combat. A dramatic example of mission focus overriding fear occurred in the last days of Commando Hunt VII when a panicked crew rallied

---

[89] Hartman, interview, 59.

[90] Opitz, interview, 10.

[91] Opitz, interview, 41-42.

around their truck-killing mission. After witnessing Spectre 13's destruction by the SAM on April 28, 1972, Steve Opitz's crew narrowly dodged an SA-2 fired at them. The pilots racked the gunship into a tight break turn and dove to dodge the missile in terror. Opitz described the scanner's frantic intercom calls: "here it comes, here it comes! I can see it—there goes the second stage. A big blue and orange flame!" Opitz thought "'Jesus, you know that thing is really tracking us!' And [the scanner] hollered, 'Break again,' and the pilot started to break and that thing went right over the top of us." The crew ran for home at low level in a panic. The fear level in the aircraft was so high, that the crew approached their breaking point. "I can remember somebody saying, 'Son of a bitch!' I said, 'Goddamn it. That's the second or third one for me!'…The TV operator got very pale and he quickly got out of his seat and I was worried he was going to bailout, and I grabbed ahold of him and he put his hand up to his mouth and he threw up…And everybody was shook." When the black crow detected a mass of moving vehicles, Opitz rallied the crew around their truck-killing mission. "I thought, 'Hell, are we going to go home with our tail between our legs?' So I thought, 'Why don't we try it? We're down low, we can get another truck. Get everybody's mind off of doing what we're doing…Nobody really wanted to get back in it.' I said, 'Arm the goddamn guns! We've got two good movers.'" The pilot endorsed his fire control officer's guidance to the gunners and the crew responded reluctantly, but then engaged and hit two trucks. "We hit the [second] truck and it started to burn and we got a big cheer out of the crew and it kind of revitalized us again."[92]

The gunship crew's successes in their truck mission generated pride in themselves, their aircraft, and their squadron that gave them the sustaining motivation to fly a vulnerable aircraft in increasingly dangerous situations. Hartman emphasized the aircraft's unique power when

---

[92] Ibid., 25-30.

operated skillfully, "it's again an order of magnitude better than anything else over there in terms of capability."[93] Hall was buoyed by the gunship's unique accuracy "Of course, we were quite proud of the accuracy of the gunships."[94] Appleby sensed he "had the feeling that I was awfully proud of what I did….I think anyone in the 16th during that era was a very proud person. If he wasn't a proud person, he didn't last." Appleby believed that pride was more than just unit esprit, "To me, personally, it was because I was proud of what I was doing."[95]

Their incredible mission successes in racking up truck kills satisfied their internal desires to compete, win, and earn the respect of fellow aviators. Crews competed with each other to account for the most trucks, and as a collective community, the gunship crews could see their clear superiority to other aircraft types (especially the "poor F-4s") over the Trail at night. Immediate feedback and official recognition through decorations and the "best of the week" films further fed their individual pride. When gunship leaders implemented hard crew scheduling that kept crews together, social cohesion could take root within each squad-sized crew. Operating a gunship was a truly collaborative effort that drew on the unique and skillful contributions of about fourteen men specially trained in nearly as many unique tasks. The necessary and vital contributions of all involved kept them all at their duty stations in battle. Gunship crews also experienced highly motivational connections to fellow combatants outside their primary groups of crew and squadron. The troops-in-contact missions, especially those in support of beleaguered American ground advisors in the Easter Offensive energized gunship crews to perform to their utmost. The gunship's expert performance during the street fighting at An Loc in 1972 became a

---

[93] Hartman, interview, 59.

[94] Hall, interview, 3.

[95] Appleby, interview, 90-91.

prominent source of individual and unit pride as the ground troops asked for gunship support to save their lives. All airmen took pride in saving American lives, but no group felt greater pride than the Air Force's rescue crews who are the subject of the final chapter of this case study.

Chapter 11: Rescue in Southeast Asia

The three day battle to rescue the crew of Boxer 22 called on the capabilities of several aircraft types and the expertise of their crews to successfully recover Lt Woodrow Bergeron. An HC-130 rescue command and control aircraft, call sign "King" orbited nearby, refueled the awaiting helicopters and relayed data between the rescue forces on the scene and rescue control centers in Thailand, Danang, and Saigon. Nail FACs directed F-4 strikes in a wide swath around the rescue site. Within the close area around Lt Bergeron, formations of A-1 Skyraiders flown by pilots specially trained in rescue (denoted by call sign "Sandy"), kept track of Bergeron's position and status, kept the PAVN away from him, and beat down the close-in defenses to soften up the area for a "Jolly Green Giant" rescue helicopter to swoop in and complete a pickup. To get Bergeron, the helicopter crew needed to zoom in at low altitude, locate his position and enter a hover over him, lower a cable and harness, and then pull him back up quickly and slip out of the area to complete the rescue. The efforts of scores of aircraft and aircrews focused on fixing Bergeron's position and to get the helicopter over him for three to four minutes, and then out again. Dedicated Jolly Green aircrews proved themselves willing to repeatedly fly their large, slow, and vulnerable aircraft at low altitude into an area lethal to fast moving jets. Between December 7 and December 9, 1969, nine Jollys attempted pickups, took hits and pulled back. It was not until the tenth try that the defenses broke and a Jolly got Bergeron out.

The hundreds of men who fought over the small piece of sky in eastern Laos that December felt a tremendous sense of urgency to rescue a fellow aviator, exposing themselves to far more risks than their normal missions against the Ho Chi Minh Trail. Although airmen

questioned American strategy in Vietnam and correctly believed the Commando Hunt Campaign did not place the United States on a trajectory towards victory, they saw the rescue of a fellow airman as a point of moral clarity, which motivated them to take whatever risks were needed. The staggering complexity of a contested rescue demanded a high degree of competency from the men leading the rescue due to the quick and often unanticipated actions needed to cope with a quickly changing situation. A contested rescue also mandated utmost precision in one's flying because bombs needed to land close to the survivor to keep the enemy at bay, but not so close as to jeopardize the life of the man on the ground. Lt Col Albert Martin coordinated A-1 support throughout the Boxer 22 battle, and flew on the last day. His report of the battle captures a sense of the difficulties, determination, and pride airmen felt towards the rescue mission. "The determined aggressiveness and extreme heroism exhibited by all SAR forces are of special note. The difficulties encountered in overcoming the elements and enemy defenses in the survivor's location was [sic] almost beyond imagination." Martin noted the A-1 wing, helicopter squadron, FAC squadron, rescue tankers, supporting fighter units, and control agencies "shared equal pride in the accomplishment of a job well done."[1]

This chapter will first briefly outline the Air Force's rescue efforts in Southeast Asia that grew from an ad hoc effort during the opening months of Rolling Thunder to a well-organized and equipped force supporting Commando Hunt. The rescue mission, as seen by helicopter and Skyraider crews, and its considerable risks and the inevitable conflicts with higher authority follows. The chapter concludes with an assessment of the rescue crews' motivation. The men who flew rescue missions over Southeast Asia accomplished a mission that they found meaningful and vitally important. They overcame many challenges imposed by a harsh flying environment and a

---

[1] Martin, *SAR Effort Report (Boxer 22 Alpha and Bravo)*, 12.

determined adversary to complete 3,883 rescues during the war.[2] Although many crews and leaders were inexperienced in rescue before Vietnam, they overcame their inexperience and threadbare manning levels, integrated their efforts as an effective team and delivered many battlefield successes. Faced with wrenching risk decisions, rescue crews routinely put their own safety in jeopardy on behalf of others. They maintained this high combat motivation despite a growing indifference towards the war back home, and their own doubts regarding the overall trajectory of the war. Senior Air Force leaders in Southeast Asia redoubled their commitments through Air Force rescue to take care of airmen in the face of a war that seemed increasingly un-winnable. Commanders and peer aviators heaped praise and decorations on rescue crews, reinforcing the motivation behind an intrinsically satisfying mission performed "that others might live."

Flying Rescue: "They've Not Only Lived up to Their Heritage, They've Enriched It"

Air Force rescue capability peaked during Commando Hunt as a new generation of powerful rescue aircraft joined a rapidly maturing rescue organization that spanned the entire theater. As the Air Force's fighter forces adapted to the conditions encountered in Rolling Thunder, the Air Force's rescue community adapted to the realities of combat by introducing new procedures, tactics, and technologies. From a rocky start in Rolling Thunder, Air Force combat rescue evolved to a formidable capability in Commando Hunt. Force structure peaked in 1969, and rescue technology continued to evolve through Commando Hunt and beyond.

Inadequate aircraft with limited capabilities and immature rescue procedures hampered early rescue efforts during Rolling Thunder. Rescue aircraft sent to Southeast Asia in 1965 were

---

[2] Earl H. Tilford, *Search and Rescue in Southeast Asia* (Washington DC: Office of Air Force History, United States Air Force, 1980), 2.

not suited for a theater-wide mission. The small HH-43 Huskie helicopter handled pickups on land, while the Korean vintage HU-16 Albatross amphibian handled pickups from the water.[3] During the ill-fated opening attack on Xom Bang on March 2, 1965, HH-43 crews rescued three F-105 pilots and a Vietnamese A-1 pilot, while a HU-16 landed in the waters of the Tonkin Gulf to pull out an F-100 pilot. Despite this apparent success at Xom Bang, rescue procedures needed refinement. Poor radio procedures resulted in mass confusion, jets providing rescue support were too fast to escort the helicopters, and the rescue aircraft were not up to the task.

The HH-43, (called "Pedro" by its crews) was a small, short range helicopter introduced in 1959 to provide local base rescue (LBR) to aircraft crashes and to help with firefighting. Intended for use close to Air Force bases, the aircraft had a very quick response time, but it had minimal navigation equipment and limited fuel capacity to go beyond 75 miles from the base.[4] To extend the aircraft range (as in the Xom Bang raid), crews carried extra barrels of fuel tied down in the aft of the aircraft to give it longer legs, or landed to refuel at prepositioned fuel caches. Bruce Smith flew HH-43s in Southeast Asia in 1968 and complained that "the LBR's probably had the most dangerous mission in SEA when involved in an ACR [aircrew rescue]. Yet we had to use underpowered, short range, unarmored and unarmed aircraft that should have been retired five to six years ago."[5] The HH-43 was a difficult aircraft to fly for extended periods because it lacked hydraulic augmentation for the flight controls. The manual flight controls tired Pedro crews because they vibrated like a lawnmower in the hands of the pilots. Michael Healy piloted

---

[3] The HH-43's officially sanctioned name was the "Huskie," but airmen more commonly used its call sign "Pedro" throughout the war.

[4] Maj Robert A. Bunton, *End of Tour Report*, December 9, 1969, Air Force Historical Research Agency, Maxwell AFB, AL.

[5] Maj Bruce C. Smith, *End of Tour Report*, December 4, 1969, Air Force Historical Research Agency, Maxwell AFB, AL.

all the rescue helicopters at test pilot school and assessed the HH-43 as "a handful to fly" because the "stick shakes in your hand as you fly. Its handling qualities were OK, but your right arm gets tired dealing with all the aero feedback into your hand."[6]

Pedros flew throughout Commando Hunt in the local base rescue role, but Pedro crews yearned for a bigger combat rescue role despite its limitations. Donald Jensen commanded the thirteen HH-43 detachments spread across Thailand and South Vietnam from 1971 to February 1972, and called his efforts to secure a wider mission for the HH-43 "Pedro Power." He advocated a broader mission accomplished through "a demanding training and upgrade program, insisting on completely professional performance and vigorous advertising of our capabilities to operational control commanders, tactical air units, civic actions people and to the Rescue Service management itself."[7] Pedro crews were frustrated by the rescue leadership in Saigon because it was slow to commit local base rescue units to nearby incidents. Robert Bunton commanded a small Pedro detachment and believed slow reactions from Saigon "resulted in lost 'saves' for LBR units. Even though, in the cases I have observed, the 'save' was made by Army helicopters." Bunton was frustrated because nearby Army helicopters did not seem encumbered by a centralized command and control system that he believed needlessly slowed down the reactions of Air Force rescue units.[8] Pedro crews were disappointed when the credit for combat saves that they could have accomplished went to other organizations. Willis Thayer reported being "beaten out of many missions by the Army, VNAF and also by the AF 20th Helo Squadron," which were all located at the same base as his HH-43 detachment, but did not have rescue as their primary

---

[6] Col Michael Healy, E-mail message to author, April 22, 2010.

[7] Lt Col Donald E. Jensen, *End of Tour Report*, April 28, 1971, 12, Air Force Historical Research Agency, Maxwell AFB, AL.

[8] Bunton, *End of Tour Report*.

mission.[9] Although Pedros lost opportunities and lost attention to the longer range Jolly Greens, HH-43 detachment commander Charles Trapp proudly reported "we are said to be tied to the flagpole of the base.…But lest anyone think that we are not involved in combat saves, a check of the records will prove that the Pedro has effected more recoveries than any other type chopper." In the opening rounds of Commando Hunt, Trapp's observation held true. From January to June 1969, HH-43 crews earned credit for 58 aircrew combat saves, while their more prominent (but less numerous) partners earned forty-eight saves for the HH-3 and sixteen saves for the newly-arrived HH-53.[10]

From late 1965 to late 1967, the Air Force modernized its helicopter rescue force with a duo of new helicopters nicknamed "Jolly Green Giant" and "Super Jolly Green Giant." The Sikorsky C/HH-3 entered service in Southeast Asia in July 1965, providing a bigger and more capable rescue helicopter. The Air Force acquired the CH-3 to carry cargo, but pressed a pair of them into rescue service until the HH-3, a variant optimized for rescue operations became available. The CH-3 lacked important rescue gear including armor, armament, a rescue hoist, and the HH-3's fuel capacity, but a bigger more capable aircraft was needed right away as Rolling Thunder heated up. Berkley Naugle was a flight engineer on one of the original CH-3s and noted the danger posed by a 450 gallon fuel tank strapped in the cargo bay to give the CH-3 an extended range. During a daring rescue attempt in November 1965, antiaircraft fire hit his helicopter thirty-five miles northwest of Hanoi and the pilot ordered the crew to bail out. "Reaching the door I hesitated. I had trained on the use of parachutes, but I had never made a real

---

[9] Capt Willis J. Thayer, *End of Tour Report*, November 24, 1969, Air Force Historical Research Agency, Maxwell AFB, AL.

[10] James B. Overton, *USAF Search and Rescue, November 1967 - June 1969*, CHECO Contemporary Historical Evaluation of Combat Operations, July 30, 1969, 18, 65, Defense Technical Information Center.

jump, even less, into enemy territory….Then the decision was made for me. The 450 gallon auxiliary fuel tank exploded, spraying me with burning fuel and luckily at the same time, blasting me out the open cargo door." A Navy helicopter pulled Naugle out of the brush a few hours later, although the rest of the crew was captured.[11]

The HH-3 had longer range and more power than the HH-43 Pedro, and it carried a pair of M-60 machine guns, titanium armor plating around the engine, and armored seats for the pilots for protection from small arms fire. Its rescue hoist facilitated rescues through Southeast Asia's triple canopy jungle, while the addition of a refueling probe enabled HH-3 crews to remain airborne for hours and air-refueling became standard operating procedure throughout the theater by September 1967. That same month, the Air Force received its first HH-53 "Super Jolly Green Giant" in Southeast Asia.[12] The HH-53 Super Jolly became the Air Force's premiere rescue platform and replaced the HH-3 during Commando Hunt. It was large, powerful and carried more than four times the HH-3's payload. The HH-53 also had improved hover performance, which had been a limiting factor for the HH-3. Hovering and climbing out of a hover taxed helicopter performance to the utmost, forcing HH-3 pilots to dump fuel, drop external fuel tanks, and even throw out extra gear in order to lighten the aircraft for high altitude, heavy, or high temperature hovers. Due to its more powerful engines, the HH-53 could hover at 6,500 feet above sea level, a substantial improvement that had stymied HH-3 missions in Laos and North Vietnam because it was unable to hover in thinner air above 4,000 feet, and struggled to climb out of hover at high gross weights.

---

[11] Berkley E. Naugle, "First Flight Across the Fence," accessed March 28, 2010, http://www.jollygreen.org /Stories/BerkleyNaugle/first_flight_across_the_fence.htm.

[12] Several accounts refer to the HH-53 as the "BUFF," which, as already noted, stood for big ugly fat fucker. BUFF did not stick because it became a more popular reference for the B-52. The first HH-53 arrived in South Vietnam on September 14, 1967. Tilford, *Search and Rescue in Southeast Asia*, 85, 90.

The smaller HH-3 carried a crew of four: two pilots, a flight engineer, and a pararescueman (called a PJ or pararescue jumper because of their parachute qualification).[13] The two pilots occupied side by side seats in the cockpit and the flight engineer manned a machine gun and rescue hoist on the right side of the aircraft behind the cockpit. The PJ manned a machine gun on the left and was prepared to descend via the hoist to the surface to help recover survivors. The HH-53 Super Jolly had a larger cockpit that brought a flight engineer behind and between the pilots, similar to a C-130. The HH-53's powerful engines allowed it to lift extra weight, so it could carry two PJs, who manned a trio of swivel-mounted 7.62 millimeter Gatling guns, one per side and one facing aft, mounted on the cargo ramp.

The wraparound windows in the front of the aircraft were a mixed blessing—they provided good visibility to help spot a survivor, but they exposed the pilots to enemy fire. Royal Brown flew both HH-3 and HH-53s in Southeast Asia and assessed the helicopter's glass nose: "the unfortunate part—you're sitting there like a big greenhouse. Nothing but plexiglass around you. You have to be able to see—but it's not going to stop bullets." The pilot's seats were armored, and the pilots had a heavy breastplate to cover their torsos (called "the iron vest"), but HH-3 pilot Dave Richardson assessed that "it restricted movement so badly I never wore it."[14]

---

[13] HH-3 accounts are divided in reference to the flight engineer. Several accounts refer to this enlisted crewmember as a "flight mechanic." MSgt Berkley Naugle crewed one of the first two CH-3s in Southeast Asia and refers to himself as a flight engineer, as does the 1965 Pacific forces *Stars and Stripes* newspaper, so this account uses flight engineer to describe this position. Naugle, "First Flight Across the Fence."

[14] When taking enemy fire, there was minimal physical difference between the protection offered by the Plexiglas windows and the aircraft's aluminum skin. Any enhanced protection gained by the aircraft skin was likely more psychological than physical. Col Royal A. Brown, interview by Lt Col V. H. Gallacher and Maj Lyn R. Officer, February 9, 1975, 22, Air Force Historical Research Agency, Maxwell AFB, AL; Dave Richardson, *Vietnam Air Rescues* (Seattle, WA: CreateSpace, 2008), 55.

The aircraft commander flew in the right seat (called the rescue crew commander in some accounts), and was responsible for the aircraft, mission, and crew.[15] The aircraft commander shared flying duties with the copilot because helicopters were far more unstable than fixed wing aircraft and had to be actively flown all the time. Unlike fixed wing aircraft, that could be trimmed for steady flight with one's hands off the controls, the HH-3 could not. Either the pilot or copilot had to attentively fly the aircraft at all times. Because many missions involved holding at orbit points while the survivors were located and defenses cleared, missions could stretch for hours. The HH-3 carried four hours of fuel and two drop tanks with an additional hour of fuel each. Aerial refueling with the HC-130 rescue control aircraft could extend missions indefinitely, mandating the pilot and copilot share flying duties to combat fatigue.

Dwindling pilot experience levels became an increasing concern throughout Commando Hunt. The Air Force rotated through the majority of its small cadre of experienced helicopter pilots during Rolling Thunder. As in other aircraft, the personnel system sent a combination of inexperienced graduates fresh from pilot training and experienced pilots "converted" to rotary wings from other aircraft types into helicopters. Although basic airmanship and inflight leadership skills were transferable, helicopters had different controls and substantially different flight characteristics than fixed wing aircraft. In a fixed-wing fighter, the left hand pushed the throttle forward for more power, but in a helicopter the left hand pulled the power lever (called the "collective") back and upwards for more power. Hovering was a skill unique to helicopters that required the coordinated application of three very sensitive and interconnected controls. Edward Modica commanded the HH-53 squadron in Thailand, and saw the average helicopter experience within his unit drop from an average of 800 hours to 350 hours per pilot. When he

[15] Since both aircraft commander and rescue crew commander appear in varying sources, this account substitutes aircraft commander for rescue crew commander for consistency with other aircraft types.

relinquished command in 1971, he was deeply concerned about dwindling expertise. "There are no experienced helicopter pilots inbound to the squadron" and capability will diminish "with pilots who are flying an aircraft alien to their previous experience and background, an aircraft which is considerably more difficult to fly with precision when compared to fixed-wing aircraft."[16] The one tour policy created some of the same problems for the helicopter community as it did for the fighter community with minimally qualified but experienced flyers arrived in theater.

Modica did not question the basic airmanship of helicopter "converts," but believed meeting the rescue mission's unique flying demands presented a greater challenge. "Their basic pilot skills are in no way doubted; nor is their motivation. Their helicopter skills, however, except in rare cases, are minimal. The main thrust of their flying experience has never encompassed flying 'in the weeds' nor performing what must seem to be violent maneuvers." Just like fighter commanders during Rolling Thunder, rescue commanders had a difficult time providing training sorties to compensate for stateside training deficiencies due to the pace of operations and mission demands. Intense rescue missions took a toll on aircraft readiness that had a further detrimental effect on local training. When Lt Col Modica took command of the helicopter squadron at Nakon Phanom in February 1970, his squadron was still feeling the effects of the ten Super Jolly Greens damaged in the Boxer 22 rescue in early December. "Missions in December 1969 and March 1970 resulted in so much battle damage that we were forced to curtail or cancel training flights for periods ranging up to three months."[17]

---

[16] Royal Brown, Modica's counterpart in command of the HH-53s at Danang reported only 20 percent of his pilots had prior helicopter experience in 1970-1971. Lt Col Edward S. Modica, *End of Tour Report*, January 29, 1971, 3, Air Force Historical Research Agency, Maxwell AFB, AL; Lt Col Royal A. Brown, *End of Tour Report*, June 28, 1971, 13, Air Force Historical Research Agency, Maxwell AFB, AL.

[17] Modica, *End of Tour Report*, 3.

With dwindling experience, commanders faced a dilemma regarding who should serve as aircraft commanders and who should serve as copilots, which created divisive motivational problems. The personnel system assigned fixed wing pilots to training as aircraft commanders or copilots before they arrived at their conversion training, and some selected for aircraft commander training were found wanting. Squadron commanders like Modica and Brown then faced the unenviable task of downgrading a newly-arrived pilot's qualification from aircraft commander to copilot, which was anathema to men who thrived on control and derived status from their skills as pilots. Brown believed "many areas should be considered prior to upgrading to aircraft commander. Among these are judgement [sic], capability, experience, maturity, etc. it is very difficult for all concerned to downgrade someone, so the problem should be solved during training by checking out only the most qualified," which he believed should be determined during conversion training by the training unit instructors.[18] At the beginning of Commando Hunt, all converts served as copilots, but this policy was unpopular among highly experienced copilots subordinated to junior aircraft commanders. HH-43 detachment commander Robert Bunton reported in late 1969 that: "during the early part of the helicopter conversion pilot program, a vast amount of operational background and experience was poorly used when high time conversion pilots were forced to fly copilot for minimum time helicopter UPT pilots. In several cases this has resulted in mission loss or degradation, because of poor operational decisions."[19] Maj Stuart Hoag, an experienced (three thousand hour) helicopter pilot, saw the problem from the other side: "much was said about the 'injustice' imposed on the converted pilots…because they were forced to fly as co-pilot for the greater part of their tour." He believed that experience trumped rank and

---

[18] Royal Brown, *End of Tour Report*, 13-14.

[19] Bunton, *End of Tour Report*.

time in other aircraft. “Several times I was forced to rely on that instinct that can only be gained through years of experience to fly out of a bad situation.” Hoag assessed that within a one-year combat tour, “a co-pilot does not gain that kind of ‘stick’ experience necessary to really make him a good helicopter pilot.”[20] Although it was clearly a divisive issue, dwindling experience levels forced commanders to upgrade copilots to aircraft commander just to fill cockpits.[21] This step appealed to the pilots’ desire to be in control and provided an incentive for copilots to do well and master helicopter flying quickly to earn a leadership role as aircraft commander .

Two or more enlisted flight crew members preformed vital mission tasks in the rear cabin of the rescue helicopters. Flight engineers performed basic aircraft preflight preparations similar to C-130 flight engineers. During Rolling Thunder, helicopter crews staged to a primitive forward operating location in northeast Laos to reduce response times, and at these forward locations flight engineers performed post flight checks and minor maintenance. Inflight, the flight engineer manned the gun station on the right side of the aircraft, scanned for threats and engaged them with the M-60 machine gun (HH-3) or Gatling gun (HH-53). During an actual rescue pickup, the flight engineer swung his gun out of the way and stood exposed in an open doorway to lower the rescue hoist to the ground. From his perch in the doorway, the flight engineer gave vital instructions to the aircraft commander to ensure he hovered over the correct spot and did not allow the rescue cable to become entangled in the jungle canopy below.[22]

---

[20] Maj Stuart H. Hoag, *End of Tour Report*, January 1969, Air Force Historical Research Agency, Maxwell AFB, AL.

[21] Although Royal Brown faced opposition from pilots he called “old rotor heads” (who flew nothing but helicopters) he afforded all his pilots the opportunity to upgrade to aircraft commander at Nakon Phanom in late 1968 and 1969. Brown was a convert, with a staggering nine thousand hours in fighters, bombers, and cargo aircraft when he arrived for helicopter conversion training in 1967. Brown, interview, 2, 4-5.

[22] Only this general overview of flight engineer duties is available due to a lack of Vietnam-era flight engineer memoirs, oral histories, and end of tour reports. Overton, *USAF Search and Rescue, November 1967 - June 1969*, 22.

One or more pararescuemen manned duty stations in the aft cabin area. Before a mission, PJs tended to the aircraft's survival and rescue gear and medical supplies. En route, they manned guns and scanned for air and ground threats. On the HH-53, a PJ manned a rear-facing Gatling gun on the open ramp at the back of the cargo bay. Most importantly, the PJs treated the wounds of rescued survivors. The aft cabin of the HH-3 lacked armor and the fuel tanks were located under the floor, so the flight engineers and PJs "would stack flak vests on the floorboards, hoping to deflect enemy bullets."[23] The more capable HH-53 included an armored floor increasing the safety of the crew in the aft cabin.

Pararescuemen were part of a small, elite and highly trained force. In 1968, there were only three hundred Air Force PJs in a force of over seven hundred thousand enlisted airmen. Prospective PJs had to pass a rigorous screening process that assessed them for high "educational, physical, and moral standards." PJ teams attracted about four hundred applicants from each eight thousand basic trainees, of whom twenty to twenty-five qualify as candidates. The handful who made it through thirty-two demanding weeks of parachute, scuba, survival, climbing, and medical training, qualified to wear the distinctive maroon beret and badge of Air Force Pararescue. This small, highly selective community, founded in 1948 set and maintained the highest standards of performance. In 1968, CMSgt Nicholas Klimis, "an alumni of the original class of pararescuemen" was the senior Air Force PJ, and expressed concern over the Vietnam generation: "We used to wonder if the newcomers would be able to live up to the reputation our PJs had earned. Well, the men who came into the career field behind us have been just great. They've not only lived up to their heritage, they've enriched it."[24] Pararescuemen were often eager to apply their extensive

---

[23] Richardson, *Vietnam Air Rescues*, 55.

[24] SMSgt James A. George, "Just Call Him PJ," *The Airman Magazine*, July 1968, 14-19.

training to the speedy completion of a rescue by descending to the surface to search for survivors and lend assistance despite the increased hazards of leaving the aircraft in hostile territory. A1C William Pitsenbarger provided an exemplary standard on April 11, 1966 when he descended from a Pedro "a hundred feet into [a] firefight with a medical bag, a supply of splints, a rifle and a pistol" to evacuate a beleaguered U.S. Army infantry squad. When the HH-43 suffered battle damage, Pittensbarger "chose to stay on the ground and aid the wounded" and died. For his brave sacrifice, he was the first enlisted man to earn the Air Force Cross.[25]

Unlike SAC, rescue crews routinely intermixed schedules and flew with different crewmembers. Royal Brown had served as a B-47 pilot in SAC, but did not pursue formed crews as a rescue operations officer or squadron commander in two Southeast Asia combat tours. "In this type of war where you were constantly short of crew members, it would have been awful hard to do." Because each rescue mission was unique due to the terrain, survivor, weather, and enemy defenses, there was little opportunity or interest to standardize procedures as in SAC. Brown saw mixing of crews as a combat enhancement because crews could learn from each other. "You learn something every day. Your procedures are standard.…But you fly with different aircraft commanders and different instructors and you're going to see different things and different techniques. And you're going to learn things better."[26]

Inflight, helicopter crews operated in a loud and fatiguing environment. The large spinning rotor blades atop the aircraft created a lot of vibration and noise. The rotor blades created low frequency vibrations, the engine and robust drive shafts generated higher pitch

---

[25] "After review, the original award was upgraded, and on Dec. 8, 2000, the Medal of Honor was presented to his family in a ceremony at the U.S. Air Force Museum. Airman Pitsenbarger is the fifty-ninth Medal of Honor recipient, and sixth enlisted recipient, from the Air Force and its predecessor organizations." National Museum of the USAF, "Fact Sheet: Airman 1st Class William H. Pitsenbarger," accessed March 29, 2010, http://www.nationalmuseum.af.mil/factsheets/factsheet_print.asp?fsID=1126&page=1.

[26] Royal Brown, interview, 27.

sounds, while the open windows and ramp in the back generated substantial wind noise. Since the aircraft fuselage was open to the air stream, the cabin became hot at low altitude and cold at high altitude. HH-53 pararescueman Albert Foster found the aft compartment fatiguing during hours of high-altitude orbiting used to cover some strike missions. "The most serious problem was lack of operational heaters. The cabin of the aircraft was in the 30°F to 50°F range all the time we flew. After two or more hours your senses are dulled and your reactions are slowed. This, together with the large amount of mission equipment you are required to wear, takes a lot out of you and your desires." Crewmembers in the aft cabin had to serve as lookouts to the sides and the rear of the aircraft to watch for threats and other aircraft. To fulfill their lookout duties, they stood in the window or sat on the open ramp, which was fatiguing. Foster reported that "the requirement to have scanners on alert at all times with no place to sit was hard on the back. After an eight to twelve hour flying day you were extremely exhausted."[27] On the ground, rescue helicopter crews faced long difficult days split between rescue alerts and squadron additional duties including safety, scheduling, and standardization and evaluation. Since most rescue units were small detachments, there was precious little manpower to accomplish administrative tasks, and frequent low manning levels aggravated the problem. Lt Col Cortez Brown, director of operations for all rescue operations in Southeast Asia identified "the shortage of authorized aircrew members has been our biggest problem." Royal Brown assessed that manning situation and unrelenting additional duties created "extremely strenuous conditions" from which "a day off is almost impossible."[28]

---

[27] SSgt Albert W. Foster, *End of Tour Report*, January 1969, Air Force Historical Research Agency, Maxwell AFB, AL.

[28] Royal Brown, *End of Tour Report*, 2; Lt Col Cortez C. Brown, *End of Tour Report*, July 1, 1971, 2, Air Force Historical Research Agency, Maxwell AFB, AL.

Mission: "The Best, Most Rewarding Operation in the Entire War"

Although American aviators had their share of doubts over the execution of the war or the relevance of their contributions to it, the men who flew in rescue attempts had no doubts over the legitimacy or value in what they were trying to achieve. As the war over the Ho Chi Minh Trail appeared to be marking time in a prolonged stalemate between 1968 and early 1972, airmen were willing to drop all other priorities in an effort to save a fellow aviator from death or capture. If the utility of bombing a ford or section of trail, or even destroying a truck may have seemed of questionable value, the moral certainty of the rescue mission enabled crews to pour unlimited firepower on PAVN gunners who might try to block the rescue of an airman in distress. Rescue missions drew on the resources of many wings and different aircraft types, so most airmen would not personally know the man on the ground they were trying to save, but allegiance to the entire external community of fellow aviators spurred crews to action. The ability to act, while at the controls of a powerful aircraft, created a sense of obligation to help a comrade. Resolve alone, had to be backed by expert planning and precise execution in the air.

As noted in the fight over Boxer 22, rescue missions combined the capabilities of a rescue task force of command and control aircraft, fighters, forward air controllers, rescue escort (Sandy) aircraft and rescue helicopters. The efforts of this entire task force focused on finding survivors quickly and accurately, suppressing the defenses, and getting the helicopter into a hover over the survivor to recover him with the hoist. But the particulars of every rescue mission were different making every rescue a unique problem to be creatively solved through the cooperation and imagination of the Sandy pilots and helicopter crews. Terrain varied from rough karst formations to dense jungle. The weather often created problems because the search and rescue forces needed to remain clear of clouds at low altitude to avoid the ground. Dave Richardson

made a difficult pickup under a very low ceiling and once the survivor was on board, flew a harrowing climb away from the ground through the low ceiling. "As I climbed, we were immediately in the clouds with absolutely no idea which direction to go" to avoid nearby terrain. "we were trapped….I did a maximum power, spiraling climb, up through the overcast, praying we would not run into anything solid. It was an agonizing time. Finally after what seemed like hours, we broke through and were back on top of the cloud layer."[29] Unlike the C-130s at the A Shau Valley, helicopters lacked a navigator and ground-mapping radar to avoid high terrain. Once in the clouds, the crew was blind. The physical condition of the survivor was often different and a complication. Many were injured from the physical trauma of a high-speed ejection, some were incapacitated, some were hung up in the jungle canopy or on mountainsides by their parachutes, and all had to remain concealed due to the proximity of enemy soldiers. William Harris commanded the rescue helicopter squadron at Danang in 1971 and 1972 and believed "the circumstances surrounding each individual case, the resources available, and ingenuity applied, dictate the course of action to take." This variability mandated a flexible approach because "no two rescue efforts are ever identical and the 'book' does not contain enough data to cover the unusual or unique situation."[30] During his Sandy checkout, A-1 pilot Richard Drury learned that "only three basic rules remained the same: find the survivor, suppress the groundfire, and get the survivor out. Beyond that, each Sandy lead had to improvise as required. There was no amount of training that could pass for the real thing."[31]

---

[29] Richardson, *Vietnam Air Rescues*, 88.

[30] Lt Col William M. Harris, *End of Tour Report*, June 1972, 3, Air Force Historical Research Agency, Maxwell AFB, AL.

[31] Richard S. Drury, *My Secret War* (Fallbrook, CA: Aero Publishers, 1979), 160.

This degree of flexibility demanded a high degree of airmanship and proficiency within the crews of the search and rescue task force. The need to orchestrate a continually swirling ballet of different aircraft fell onto the shoulders of the Sandy lead, the lead A-1 pilot, who had to blend the capabilities of all participants into a single team effort. Initially the A-1 was not considered a rescue asset. A-1 pilots flew interdiction and close air support in addition to rescue escort until midway through Commando Hunt, after which their dwindling numbers limited them to rescue missions. Ground forces and FACs especially appreciated the A-1 in tight close air support situations because its slow speed allowed highly accurate weapons drops very close to the target. The A-1, initially designed in 1944 was also valued for its long endurance and heavy bomb load, which also made it an ideal rescue escort. The Air Force began modifying A-1s from mothballed post-Korean U.S. Navy stockpiles for counterinsurgency operations in Southeast Asia in 1963. The Air Force operated three A-1 squadrons in Southeast Asia of reconstituted aircraft. By Commando Hunt, the A-1 pilots mirrored the other flying communities in Southeast Asia and had a mixture of young pilots fresh from pilot training and an older cadre of retreads.

Once qualified in the A-1 for interdiction and close air support, pilots entered a special training program to qualify in rescue escort (Sandy missions). As a new A-1 wingman, a veteran pilot told Richard Drury that rescue was "cherished" as "THE mission" for A-1 pilots. "This rescue thing is the best, most rewarding operation in the entire war. It's really great to actually get somebody out after he's been shot down. That's a great thing." The mission posed tremendous challenges, but paid off with tremendous rewards of personal satisfaction after a successful rescue. Sandy leads had to understand and orchestrate the actions of every aircraft involved in a rescue. They also had to master the entire range of conventional weapons, guided weapons, and special weapons suited for rescue to include smoke and riot gas, to pull off a successful opposed rescue. When the Sandy and Jolly crews were based together, they appreciated the opportunity to

collaborate on creative solutions. HH-3 pilot Dale Weeden flew from Nakon Phanom, the home of the A-1 Sandy unit, and attributed his unit's success to its co-location with the Sandys. "Having the two prime members of the SAR team co-located was extremely beneficial in mission prosecuting. By briefing the same intelligence, standing alert together, debriefing together, etc., the SAR team was able to develop refinements of tactics and teamwork that would otherwise have been impossible."[32]

Risk: "I Really Didn't Think We'd Come Out of the Thing Alive"

The risks inherent to rescue operations were substantial. Helicopters were complex, vulnerable aircraft and during a pickup had to operate within range of everything from small arms to heavy antiaircraft guns and in some environments SAMs and MiGs. Their slow flying speed made them easy to hit. Once in a hover over the survivor, they became a stationary target for enemy gunners. Small hits in the engines or rotors could bring down the entire aircraft due to their complexity. Jim Richardson wrote he "knew of a helicopter that was downed by a single crossbow bolt. The shaft severed an oil line and the engine seized."[33] Edward Modica considered his HH-53 Super Jolly "an extremely capable helicopter" but "a very lucrative target."[34]

Due to the helicopter's vulnerability, Sandy leads did thorough searches of the areas around the survivors and conducted strikes to clear the way for the helicopter. Although they selflessly "trolled" for fire by flying low and slow over the potential ingress and egress routes, they could never be sure that the path was clear because disciplined gunners might hold their fire

---

[32] Maj Dale N. Weeden, *End of Tour Report*, December 8, 1969, Air Force Historical Research Agency, Maxwell AFB, AL.

[33] Richardson, *Vietnam Air Rescues*, 55.

[34] Modica, *End of Tour Report*, 2.

until the helicopter entered its hover. HH-53 squadron commander Albert Holcomb identified the inescapable uncertainty surrounding a rescue. "It is extremely difficult to predict the type of environment a survivor is in until the on-scene commander (OSC) usually an A-1, personally evaluates the area and trolls for ground fire. Even then the truth does not always emerge until a helicopter makes an approach to the survivor's position."[35] Stephen Sutton assessed this need for rescue crews to ultimately "play it by ear" was "exceptionally hazardous."[36]

Because many of a helicopter's risk decisions and its risk mitigation were provided by the rest of the rescue task force, helicopter crews repeatedly pleaded for expert Sandy pilots and capable escort aircraft. Despite the rescue community's pleas, the A-1 force went through several force contractions throughout Command Hunt. Because the prop-driven A-1 was considered antiquated by 1970 (its pilots called it the "Spad," likening it to a WWI biplane), and it drew down to just a single squadron in 1971, Jolly crews feared losing their most crucial support.[37] Sandys attacked known guns and used smoke to screen and isolate helicopters from defenses that they could not defeat. White phosphorous bombs designed to detonate in the air created an opaque barrier several hundred feet high to screen the rescue. Sandys also used smoke to mark an approach point and a point the Jolly Green should not go beyond in the final run to the survivor. These markers, and a close escort by A-1s allowed the helicopter to approach at treetop height and maximum speed. Royal Brown thought it was "the hardest thing in the world to get new guys to" stay at treetop height because at that altitude they have to surrender their vision and final run-in decisions to their escorts and run in blind. "You don't worry about seeing anything. It's hard to

---

[35] Col Albert L. Holcomb, *End of Tour Report*, February 16, 1971, 2, Air Force Historical Research Agency, Maxwell AFB, AL.

[36] Lt Col Stephen L. Sutton, *End of Tour Report*, March 29, 1973, Air Force Historical Research Agency, Maxwell AFB, AL.

[37] The A-7 attack jet replaced the A-1 in late 1972 after Commando Hunt.

get a new guy to look at it like this. He wants to be up where he can see something" but if he does and runs in at "two or three hundred feet where he can be seen" he can be more easily shot down." [38] Sandy Pilot Randy Jayne angrily recalled a mission where a senior officer visiting from Seventh Air force piloted his Jolly at 150-200 feet above the trees (instead of treetop height), needlessly drew thirty-seven millimeter fire from that height, and had to withdraw spoiling the rescue because he was flying at "high altitude."[39] At a half mile from the survivor, Sandys called for the survivor to pop a smoke signaling the helicopter to slow to a hover and to pinpoint the survivor to lower the rescue hoist. "Once you come to a hover, then you start looking for this guy, by the other crew members looking out the door for him," although the darkness created by the jungle canopy hid many survivors from view. During his two rescue tours, Royal Brown recalled he never actually saw a survivor get to the hoist due to the thick, dark jungle canopy.[40]

The hover over the survivor's location constituted some of the most intense flying in Southeast Asia. The aircraft commander had to focus on keeping the aircraft absolutely still as the flight engineer lowered the rescue harness, so that it would not become entangled in the jungle canopy below. The copilot checked aircraft systems, advised the commander, and handled the radios which could contain an overwhelming degree of chatter in the final stage of a rescue. The chatter could become so great, that some aircraft commanders chose to isolate their intercom so that all they could hear were the flight engineer's hover instructions. The flight engineer relayed the status of the harness and called for adjustments to the aircraft's hover when needed. In some cases when the survivor was hurt or hidden, the helicopter crew had to raise and lower the harness

---

[38] Royal Brown, interview, 10-12.

[39] Randy Jayne, Buck Buchanan, and Ron Smith, "Recollections of the Nail 31 SAR," accessed April 22, 2010, http://www.skyraider.org/hook/nail31ab/nail31.htm.

[40] Royal Brown, interview, 10-12.

several times, like fishing, before bringing up the survivor. Holding a hover while under fire could be argued to be worse than flying through flak on a bomb run because the helicopter had to remain motionless to avoid entangling the hoist or endangering the men on the rescue line. A hover under fire might be likened to a soldier standing still in the middle of an open field under fire, compared to a swift cavalry charge through a defended area. Strong nerves were required to remain motionless compared to flying swiftly through fire. In a hotly contested recovery near Tchepone Laos, Dave Richardson held a hover for four minutes as guns fired at his helicopter from every direction. Richardson successfully pulled out the Navy attack pilot (call sign Streetcar 304), but the hover under intense fire "seemed like ten minutes to me."[41] Royal Brown recalled one mission where he held his hover for "almost an hour."[42]

Low and vulnerable, the aircraft commander in the helicopter had to decide how long to hover over a survivor and whether to risk an additional man by sending down his PJ. Dave Richardson wrote the aircraft commander had to determine whether the risk to his aircraft and crew was acceptable. "It was clearly understood, and never questioned, that the Jolly pilot had the final say, or right of refusal as to whether the pickup proceeded." Due to the risk, rescue helicopters flew in pairs with one crew as the "low bird" which flew in to make the pickup, while the other crew in the "high bird" orbited nearby ready to charge in to rescue their partners if the low bird was shot down. The low bird aircraft commander, then was not only putting his four to six-man crew at risk, he was also putting the safety of the other airmen in the high bird on the line because they would move in for a rescue attempt. Jolly aircraft commander, Capt Oliver O'Mara made three attempts to rescue a survivor trapped in the bottom of a canyon and was hit by guns

---

[41] Richardson, *Vietnam Air Rescues*, 140-141.

[42] Royal Brown, interview, 12-14.

lining the surrounding ridges. The impacts "sounded like popcorn on a griddle" as his helicopter hovered to make the pickup. When gunfire disabled O'Mara's hoist, the high bird piloted by Maj Leland Kennedy moved in. After taking multiple hits in two unsuccessful passes, Kennedy consulted his crew and "the crew wanted to try again." On the third pass, "I really didn't think we'd come out of the thing alive. But once you see the man on the ground you want to get him." Like the forward air controllers, B-52 crews, and C-130 crews, a slight personal connection catalyzed even greater exertions from the men in the air to help. Kennedy flew through such intense defenses, he experienced a level of detachment that suggested a state of dissociation in response to extreme stress. "After the second pass, I felt a sense of detachment, as if I were watching the whole thing on a movie screen. You don't stop and think about it anymore. You just do the things you're trained to do."[43]

Aircraft commanders had to weigh the risks and potential benefits of lowering their PJs to the jungle floor below. When the survivor was in good condition and talking on the radio, the PJs stayed on board the helicopter, but when a survivor was injured, suddenly dropped off the radio, or did not get into the hoist within a few minutes, the crew commander faced a decision that would put an additional man at risk and tie the helicopter to that location. PJ George Schipper believed that dropping down to see if a survivor was dead or alive was "another of the calculated risks of my profession and one that I am trained for." Schipper saw himself as better trained at survival, escape, and evasion than any other group in the Air Force and did not want to live with the doubt of not checking. The sense of obligation to act stemmed from the PJ's unique skills and his helicopter's unique flight characteristics, and that obligation overrode fear and the potential

---

[43] Kennedy's crew successfully completed the rescue. Kennedy and O'Mara earned the Air Force Cross on this mission. Kennedy earned a second Air Force Cross two weeks later on another rescue mission. Robert K. Ruhl, "The Man With Two Crosses," *The Airman Magazine*, October 1967, 10.

guilt over not using those skills and power. On one rescue attempt, Schipper's crew "left the scene not knowing whether we left a man to suffer and die. I still think of this, and probably will for the rest of my life because I would have taken the calculated risk to see if there was anything that could be done for the man."[44] On a similar line, Sandy pilot Richard Drury wrote that although losses were very high during rescue missions, "what bothered us most, more than the ground fire perhaps, was wondering at our ability to actually make the rescue when the time came."[45]

The difficulty of finding the appropriate balance between the mission and its considerable risks telescoped from the helicopter aircraft commander and Sandy lead to the rescue task force commander orbiting overhead in the HC-130, and to the rescue controllers at Seventh Air Force. Through their decisions to commit large rescue forces, leaders at each of these levels placed rescue as the highest priority during Commando Hunt. Gen Brown's support of Boxer 22's rescue and several other prominent search and rescue efforts made a definitive statement though his actions and allocation of men and machines to rescue operations that the lives of American Airmen came first. Pacific Air Force's official history of rescue operations between 1967 and 1969 praised "immeasurable benefits of aircrew morale and the denial of a source of exploitation to the enemy" as incalculable benefits of Air Force rescue commitments.[46]

---

[44] TSgt George E. Schipper, *End of Tour Report*, August 1969, 7, Air Force Historical Research Agency, Maxwell AFB, AL.

[45] Drury, *My Secret War*, 163.

[46] Overton, *USAF Search and Rescue, November 1967 - June 1969*, 68-69.

Authority: "Fortunately the Problems…Affect Very Few Missions"

Although Air Force leadership vigorously committed men and material to rescue operations, rescue crews perceived the actions of their headquarters and many of their commanders as unhelpful. Slow and intrusive headquarters and inexperienced rescue commanders generated frustration among many rescue crews, but they did not reduce the commitment or motivation airmen felt towards the rescue mission. Inside Seventh Air Force headquarters, a small joint search and rescue center (JSRC) staff of five officers, four enlisted rescue controllers, and three radio technicians worked for the commander of the Third Aerospace Rescue and Recovery Group (3ARRG), who led all Air Force rescue forces in theater. The 3ARRG commander also fulfilled a Seventh Air Force staff function as the director of search and rescue. This joint search and rescue center "controlled and coordinated" the diverse rescue units spread across the theater. The theater-level command post coordinated with smaller, subordinate sector controllers at Udorn Air Base Thailand, and Danang Air Base South Vietnam, and the Seventh Fleet. One level below the sector controllers, an airborne mission commander flew aboard the rescue HC-130P "Crown" aircraft. This airborne commander "acted as a direct representative of the JSARC and controlled the SAR mission activity to evaluate mission requirements, coordinate the SAR Task Force (SARTF) activity, monitor mission progress, and most importantly, maintain the long-range communication capability for all SAR forces."[47]

The officer and enlisted controllers at the headquarters echelons allocated resources to search and rescue efforts, tracked overdue aircraft, and kept their commanders informed on the status of ongoing efforts but were harmed by lack of relevant experience and short manning. Paul Gerblick served as a controller at the JSARC in Saigon in 1968 and then commanded the sector

---

[47] Ibid., 6-8.

Rescue Coordination Center at Udorn in 1969. From his vantage point at headquarters, he saw improvements in rescue resource allocation and tracking through his year-long tour, and developed a sense of resource limitations within the large combat theater. He was personally frustrated by limited manning and frequent personnel turnover. At the sector center at Udorn, four of his five officer controllers completed their tours and he received only one replacement officer in a two month period. Rescue crews in the field sensed the constant turnover of expertise at headquarters. HH-3 pilot Stuart Hoag believed that although rescue crews refined very solid procedures over time, headquarters had to relearn the same lessons over again. "These were all good rules and time and again proved their worth during my tour. However, it seemed that every time a commander of higher headquarters and SAR controllers were changed, these rules had to be learned all over again, usually by a bad mission."[48] Albert Holcomb, the helicopter squadron commander at Danang noted that rescue controllers throughout the theater lacked helicopter experience and did not understand the capabilities and limitations of rescue assets. "It is evident that there are many decisions being made involving the control of these aircraft by personnel who have not had rotary wing experience."[49] Helicopter pilot Robert Bunker transferred to the JSRC and rescue group staff as a standardization pilot midway through his combat tour in 1968 and wrote: "I found I was the only person in the headquarters with actual experience in the field." Bunker observed that a lack of relevant experience delayed decisions by the headquarters because controllers would have to relay questions to the on scene commander that otherwise might have been answered by an experienced rescue aircrew on the spot.[50]

---

[48] Hoag, *End of Tour Report*.

[49] Holcomb, *End of Tour Report*, 18.

[50] Lt Col Robert A. Bunker, *End of Tour Report*, December 8, 1969, Air Force Historical Research Agency, Maxwell AFB, AL.

As a rescue controller, Paul Gerblick was often frustrated by disruptive inquiries by the Seventh Air Force staff during ongoing missions, and sensed their negative impact on time critical operations in the field. "Often the rescue controller on duty was hampered…by unnecessary questions and directions from 7AF personnel. As an example, during the most difficult phases of a recovery, information would be requested of the On Scene Commander by a Senior 7AF officer."[51] Headquarters distance from the scene and the delays inherent to three layers of command and control meant that the JSRC was going to be out of touch with a fluid, complex, and often chaotic rescue. Events changed too quickly to be able to keep headquarters sufficiently informed for the staff to make meaningful tactical inputs. Robert Smith flew as a HH-53 aircraft commander and argued headquarters slowed decisions in time-critical situations. "Valuable time has been lost by holding the rescue forces in a safe area while JSRC updates their intelligence information prior to committing the forces. Time lost in getting the SAR forces on scene only decreased the survivor's chances. The Sandys and Jollys should make the final decision to attempt any rescue."[52] Bruce Rauhe flew as an HC-130 pilot and recounted a confrontation between his airborne mission commander (AMC) in the HC-130 and rescue controllers back on the ground during a rescue that was not going well. "The AMC withdrew the SAR forces for regrouping. At the time of withdrawal, the Da Nang RCC [rescue coordination center] and King [the JSRC] had been directing the mission which had degenerated into a free-for-all. The confrontation was blunt: 'Do you have a plan? If not, I do.' The AMC was given

---

[51] Maj Paul Gerblick, *End of Tour Report*, December 10, 1969, 1-2, Air Force Historical Research Agency, Maxwell AFB, AL.

[52] Maj Robert E. Smith, *End of Tour Report*, December 9, 1969, Air Force Historical Research Agency, Maxwell AFB, AL.

permission and the recovery was completed without further casualties."[53] Rauhe assessed this fall 1968 confrontation as instrumental in precipitating a resolution in control responsibilities between the ground controllers and the airborne mission commander. During his second rescue tour in 1970-1971, Royal Brown observed many of the same recurring and frustrating problems with slow and imperfect command and control, but "fortunately the problems mentioned above affect very few missions."[54]

Some rescue problems stemmed from the lack of a strong rescue career track. The Aerospace Rescue and Recovery Service (ARRS) was the organization responsible for the Air Force's rescue assets, but it did not enjoy high organizational standing. ARRS was a subsidiary of Military Airlift Command, a major command run by a four-star general that operated the large cargo aircraft around the world. The air rescue mission was largely unrelated to the central focus of its parent organization. ARRS was run by a brigadier general, normally from a specialty other than rescue. Allison Brooks and Frank Everest led ARRS during Vietnam. Brooks had experience as a fighter, bomber, and transport pilot, and Everest was a test pilot.[55] Rescue units were normally small detachments led by fairly junior officers. Local base rescue units, for example possessed two or three HH-43s and only twelve to eighteen personnel.[56] These detachments operated as tenants on bases run by other major commands, which limited rescue pilots opportunities for higher commands. The Aerospace Rescue and Recovery Service's

---

[53] Maj Bruce L. Rauhe, *End of Tour Report*, June 1969, 2, Air Force Historical Research Agency, Maxwell AFB, AL.

[54] Royal Brown, *End of Tour Report*, 4.

[55] "Biographies: Major General Allison C. Brooks," accessed March 30, 2010, http://www.af.mil /information/bios/bio.asp?bioID=4800; "Biographies: Brigadier General Frank Kendall Everest Jr.," accessed March 30, 2010, http://www.af.mil/information/bios/bio.asp?bioID=5378.

[56] Brig Gen Allison C. Brooks, "Aerospace Rescue and Recovery—Southeast Asia to Apollo," *Air University Review* (June 1967).

organizational standing capped rescue pilots at colonel, at best, with lieutenant colonel or major more common terminal ranks.

Due to the rescue community's rank and organizational structure, few officers with previous helicopter experience led rescue units in Southeast Asia. For some crews, this led to concern and frustration. Maj Edward Quinlan reported during his tour, experienced helicopter pilots led only five of the fourteen local base rescue detachments, and none of the four helicopter squadrons in Southeast Asia. Although Quinlan acknowledged his fixed-wing leaders were "highly competent pilots," he expressed frustration because the "'experts' on whose experience and energy the helicopter business has depended for many years, have found themselves so far down the command structure as to have little voice in the operational decisions which effect the mission."[57] Maj Phil Hurley, an HH-43 pilot, was concerned about his commander's mismatch between responsibility and necessary helicopter and rescue expertise. Hurley observed it took an average of ten months for a fixed wing pilot to upgrade to aircraft commander, so many fixed-wing conversion pilots lacked the leadership in the air that they enjoyed on the ground. He thought the fixed wing conversion pilots were good, "I was quite impressed with the quality of the fixed wing pilots—the percentage of good ones being near 90 percent. We produced many outstanding helicopter pilots and were discouraged to see most of them return to fixed wing aircraft after the SEA tour." But he was concerned that "almost every Detachment [had] a fixed-wing conversion pilot for commander—a strange position because of their lack of experience in the LBR operation and because of their copilot status for most of the year." This was also a strange position for "the old-time chopper man since he had the moral responsibility for running

---

[57] Edward G. Quinlan, *End of Tour Report*, December 2, 1969, 1-2, Air Force Historical Research Agency, Maxwell AFB, AL.

the detachment, making the operational decisions, and keeping the Commander out of trouble—yet he lacked the authority for his decisions."[58]

Rescue units assigned command to the senior officer, seemingly detached from his experience. Unlike fighter units that were organized as wings at one base, the rescue wing headquarters for Southeast Asia was based in Hawaii and rescue squadrons and detachments occupied dozens of separate locations. Fighter wing leaders had the opportunity to observe potential squadron commanders in combat before selecting them to lead a fighter squadron. Wing commanders and directors of operations assessed their leadership pool and either kept senior lieutenant colonels deemed less than capable of leading fighter missions on the wing staff or reassigned them to Seventh Air Force. This was not the case for the rescue community with a distant and disengaged wing infrastructure. Royal Brown saw command assigned strictly by rank in his first rescue tour at Nakon Phanom. "I was the operations officer. Off and on I was the [detachment] commander. At this time over there, if you were a commander and a guy came in that outranked you one day, he was automatically the commander and you went back down. But mainly my job was operations officer." [59] Some officers, even without previous rescue background, were good commanders, while others were not. Royal Brown became a respected rescue leader; he converted to helicopters with a staggering amount of aviation experience, nearly nine thousand flying hours, in fighters, bombers, and transports. After his tour as operations officer in Thailand, he volunteered to return to Southeast Asia as a helicopter squadron

---

[58] Maj Phil C. Hurley, *End of Tour Report*, November 24, 1968, 1-2, Air Force Historical Research Agency, Maxwell AFB, AL.

[59] The transcript indicates "wing commander" but Nakon Phanom had a rescue detachment at the time (a unit smaller than a squadron), and the rescue wing headquarters was located in Hawaii, so Col Brown was most likely referring to leadership of the rescue detachment. Royal Brown, interview, 5.

commander. By that time, his helicopter flying skills and leadership were highly regarded and Seventh Air Force handpicked him to fly in the daring raid on Son Tay in 1970.[60]

At the other end of the spectrum, Dave Richardson clashed repeatedly with his operations officer, who had come from SAC bombers and tried to apply SAC's hard and fast approach to rules, standardization, and centralized control. This leadership style did not mesh well with the flexible and creative approaches needed for rescue due to the ever-changing circumstances. "He was particularly galled that, since he had low helicopter time, he had to fly as a co-pilot," and in Richardson's assessment "managed, single-handedly, to take the Squadron morale from sky-high to rock bottom."[61] Maj Harvie Stringer made a slightly more circumspect critique of the squadron leadership at Danang in 1968 in his end of tour report. "Morale of personnel was marginal due to poor leadership and inadequacy of leave privileges between units of the same mission." His critique of squadron leadership suggests dissatisfaction with leaders chosen on the basis of their rank and not capability, perhaps lacking credibility as aviators—the universal standard fliers applied to their peers: "rank and time in grade is not indicative of leadership capabilities." Although he was dissatisfied with his leaders, Stringer assessed they did not harm the individual achievements of rescue crews once in the air. "The outstanding performance of the aircrews was not related to leadership or support by higher headquarters."[62] The rescue community delivered sustained outstanding performance, despite the grumblings about command and control, unit leadership, or the course of the war because they intensely believed in importance of their mission.

---

[60] Ibid., 2, 34.

[61] Richardson, *Vietnam Air Rescues*, 99.

[62] Maj Harvie L. Stringer, *End of Tour Report*, December 8, 1969, Air Force Historical Research Agency, Maxwell AFB, AL.

Motivation: "The Last Noble Role We Had"

Although many pilots did not clamor to get into the rescue field, those who flew rescue in Southeast Asia developed a powerful commitment that buoyed them in combat and sustained them through their combat tour. At UPT, helicopters were unpopular. While Michael Morea was at pilot training in 1961, he observed "nobody wanted to fly a helicopter, so the last guy in the class…invariably got the helicopter."[63] Some chose helicopters to avoid SAC, the other unpopular option at assignment time. Jerry Singleton initially hoped for a fighter, but much of his class of 1962-1963 was destined for SAC. He requested a helicopter because he thought "it would be easier to get out of that [when compared to SAC] to go to Flight Test School, and that might give me an edge, being rather unique, because the skills of helicopter flying are very different from fixed-wing flying."[64] As a single-seat fighter, the A-1 attracted young pilots, who also saw the aircraft as a romantic throwback to the World War II imagery they grew up with.

Acculturation into a rescue culture came later for both communities. Because the Air Force operated helicopters for both rescue and cargo carrying, introduction to the rescue ethos came at HH-43 training for the local base rescue mission, or HH-3/HH-53 training for long-range rescue. A-1 pilots were not introduced to rescue until they proved themselves as capable attack pilots at their operational units in Thailand. Crews entered rescue training with mixed motivations. Royal Brown converted to helicopters in 1967, and stated he had "been wanting to get into rescue for some time and wanted to get in a helicopter."[65] In 1965, Jerry Singleton had been in a helicopter unit testing the HH-3 for cargo, and hoped for test pilot school when his leadership

---

[63] Morea, interview, 18-19.

[64] Singleton was the copilot of the CH-3 (with the 450 gallon auxiliary fuel tank) hit over North Vietnam on November 6, 1965. Jerry A., Lt. Col Singleton, interview by Dr. James C. Hasdorff, October 30, 1992, 12, Air Force Historical Research Agency, Maxwell AFB, AL.

[65] Brown, interview, 1.

"invited" him to deploy to Southeast Asia in a rescue role.[66] Both, as in other Air Force aviation cohorts, were initially motivated by a desire to fly, and they applied that passion to a new mission in Southeast Asia.

Once in combat, helicopter crews derived motivation from the unique capability of their ungainly aircraft to hover over a survivor and a corresponding sense of obligation to use that capability to help other airmen. Similarly, A-1 pilots understood their slow-moving but rugged Skyraiders were uniquely suited to search for a survivor and escort the helicopters. The interlocking commitments between elements of the rescue force, the technical demands of flying a complex rescue mission (and the zenith of flying proficiency needed to succeed) provided additional motivation. A-1 pilots accepted some of the heaviest risks throughout the entire war as Sandys but derived high combat motivation from the opportunity to save a fellow aviator from death or capture. The high risks the Skyraider pilots accepted were an indication of their high combat motivation. As the jet fighter force shifted to high altitude attacks during Commando Hunt, the Sandys stayed low. The A-1's low speed and heavy payloads limited its ability to climb, while the Sandy mission demanded very low altitude searching to locate signs of survivors and defenses. George Marrett recalled that although his A-1 squadron used minimum altitudes to limit risk on interdiction and close air support missions in Laos, there were no minimums for rescue. "If we were on a rescue, a pilot could fly at any altitude or airspeed he needed to get ordnance on enemy guns opposing the rescue. A search and rescue was so important that we simply briefed the pilots to use good judgment in determining the flight maneuvers that would work to silence the guns." Marrett believed that risk-limiting measures were appropriate for routine missions, even those in direct support of Laotian troops (since he frequently flew close air support in

---

[66] Singleton, interview, 17-23.

Northern Laos) but rescue was the exception. "The war in Vietnam was a limited war; a war of attrition. Nothing happened any one day that would be pivotal to the final outcome—except for the rescue mission."[67] This collective consensus to do whatever was necessary to complete a rescue was founded on individual commitment by aviators at the bottom and organizational commitments (by Seventh Air Force) at the top. In a war where day to day operations did not appear to be leading to victory, all missions except rescue could wait, and by Commando Hunt, all missions except rescue could trade mission effectiveness away to limit the risks.

The interdependence within an entire search and rescue mission set up mutual obligations that provided combat motivation by locking each team member into an essential role. The Jolly crews relied on Sandys to guide them and attack threats. The low helicopter depended on the high bird to come in to rescue them if they were shot down. These two rescue elements relied on FACs and fighters to clear and suppress defenses around the fringes of the rescue effort. This mutual dependence cemented crews into their necessary roles dictated by the unique capability and weapons load of each aircraft. As Dave Richardson began his escape from the pickup at Tchepone, he saw a gun about to open fire, but could not maneuver due to the escorting Sandys. His escort fired his last two remaining rockets, destroying the last obstacle to the team's escape. He was sure these pilots saved his life.[68]

Seeing others performing their duty in equally hazardous airspace bolstered resolve. Crews could hang in there if others could persevere. Aircraft commander Royal Brown described the physical and moral interdependence between the Jolly and the Sandy escort during a pickup: "Once you're over this guy, there's where your Sandys come in. There's four of them. They're

---

[67] George J. Marrett, *Cheating Death: Combat Air Rescues in Vietnam and Laos* (Washington, D.C: Smithsonian Books, 2003), 130, 197.

[68] Richardson, *Vietnam Air Rescues*, 138.

going around him and you, close as they can get. I've had them rock the airplane. All the time they're going around you, they're putting out all kind of ordnance, everything they've got. And they carry a tremendous load." Although the A-1s provided an essential aspect of physical security by bombing, strafing, and rocketing ground defenses, their presence provided a psychological dividend. Brown likened the psychological effect to a popular Peanuts cartoon character who carried a security blanket: "It's kind of like Linus and his little blanket. It's the best security feeling in the world just to see Sandys right around you."[69]

The two most critical decision points, which were also indicative of combat motivation, were the Sandy pilot's decision to commit the helicopters, and the aircraft commander's decision on how long to remain in the hover. Either the Sandy lead or the Jolly commander could scrub the attempt, but concern for the uncertain fate of a fellow aviator on the ground pushed them ahead and then their decisions locked them to each other. On a gripping mission as Sandy Lead, George Marrett located a parachute hanging in a tree in a quiet, but hostile section of Laos, but was unable to raise the missing pilot and had to decide to either call off the rescue or call in the Jolly to search the jungle under the parachute. "It was a perilous decision for me to make, whichever way I decided to go." Either choice would have been justifiable to the rest of the rescue force. "If I returned to NKP [Nakon Phanom] the rescue was over. If I called in the Jolly for a rescue attempt, it would be extremely dangerous without the survivor helping relay information on what was going on beneath the trees." Marrett ordered the rescue attempt, and the Jolly crew lowered their PJ, Airman Charles King, who located the inert pilot, Maj Charles Brownlee, and hooked him up to the hoist. The Jolly received ground fire as they reeled in King and Brownlee, and the

---

[69] Brown, interview, 10-12.

Jolly pilot elected to leave the hover before the men reached the cabin. In their escape, the cable caught on a tree, failed and both men were lost.[70]

Marrett's guiding principle was that "as long as American airmen were on the ground in enemy territory, we would attempt to rescue them." Ultimately his decisions in the heat of battle as Sandy lead balanced the physical dangers to himself and the rest of the rescue force against the obligation he felt towards a fellow aviator on the ground, and the moral impact of that decision on his conscience. Two months after the loss of King and Brownlee, he flew a supporting Sandy role in an unsuccessful search and felt disappointed. "Reluctantly the search and rescue force returned to NKP, knowing another pilot was lost somewhere in the jungle below. It was always sad to depart knowing we were the last hope of recovery." But later, once again as Sandy lead, he took an unsuccessful search much harder because he was responsible for the decision. "When our fuel state got low, we went home. The F-4 pilot had either been captured or killed; I would never know. His loss still haunts me. It's a feeling common to every Sandy lead who has had to leave a flying buddy stranded in the jungle."[71] Marrett had done everything he could within the physical limitations he had to deal with. Once his fuel ran low, there was no longer any way to compromise with the physics of flight and the fuel in his tanks, so he had to return to his base unsuccessful.

Jolly pilots faced a similar dilemma when deciding how long to hover in an opposed rescue attempt. The Jolly pilot in the failed attempt to save Brownlee received ground fire in the cockpit and fuel tanks, and took a gamble that the men on the cable would survive with the entire crew's lives now at risk. In other situations, like that of Boxer 22, at least two helicopters got

---

[70] Marrett, *Cheating Death*, 149-153.

[71] Ibid., 77, 171, 193.

within yards of Lt Bergeron, but withdrew to allow the A-1s to attack more of the guns and create a more permissive environment.[72] Dave Richardson took a hard line stance with his crews by favoring staying in the hover regardless of the defenses, which concerned some of his crewmembers. "I felt our job was to rescue the man now, not force someone else to do it later. I would brief my crew when coming on alert of my concept of Air Rescue, which was that we were there to rescue people. My philosophy was that, once in a hover, we would stay until the survivor was on board." He was so determined he locked his shoulder harness before entering the hover so that he would not interfere with the flight controls if he were shot and asked his copilot to do the same.[73]

Once set in motion, Sandy wingmen and Jolly crewmembers were locked in by their leader's decisions. The firepower supplied by A-1 wingmen was essential to the success and survival of the rescue force. As a new Sandy wingman, George Marrett experienced an unexpected loss of aircraft performance en route to a rescue over North Vietnam. As his aircraft slowed, descended, and fell behind the formation, he considered jettisoning his ordnance to save himself and his aircraft. "Something was terribly wrong. I thought about jettisoning my ordnance, but I needed it for the rescue."[74] Not wanting to hurt the chances of a successful rescue, Marrett kept his ordnance and figured out his problem (he had inadvertently left his speed brakes deployed, sapping his speed and altitude) and completed a successful mission.

The technical demands of flying very low, keeping track of the survivor, and watching for enemy guns could be all consuming. Single-seat Sandy pilots were extremely busy during a rescue. Their tasks included searching for threats, monitoring three radios, accurately delivering

---

[72] Schlight, *Rescue at Ban Phanop*.

[73] Richardson, *Vietnam Air Rescues*, 58.

[74] Marrett, *Cheating Death*, 78.

ordnance around the survivor, flying formation, avoiding midair collisions with the other rescue aircraft, monitoring their engine and fuel state, and not hitting the ground—performed all at the same time, throughout the entire rescue. With that kind of workload, there was no time to show apprehension. Although Jolly crews could divide their labors, they also experienced intense concentration on their assigned tasks especially once the helicopter entered its hover. Once committed to the very hazardous run-in near Tchepone to rescue Streetcar 304, Dave Richardson found an inventive way to divert his crew's apprehension by betting them crew steak dinners if the copilot could (improbably) hit a sand bar with their auxiliary fuel tanks as they lightened the aircraft for the final run in. Although there was "a high degree of anxiety among my crew….This focused the crew's attention on something other than our predicament."[75] Richardson broke some of the tension and their crew made a successful save at the end of the costly three day battle.

An aircrew's sustaining motivation was energized by several powerful internal and external factors. The ability to provide a unique and indispensable capability to a challenging rescue problem, the desire to win, and recognition satisfied many of an aviator's internal desires. Obligations to the rescue force and one's flight engaged close external allegiances, and a sense of duty and obligation towards an unknown fellow airman, stranded in hostile territory, provided a powerful sense of purpose for a rescue effort. Rescues tested an aviators' sustaining motivation because crews often knew ahead of time they would face a difficult mission. The state of rescue technology precluded night rescues until the last year of the war, so many efforts extended across two or more days. The rescue community found some success in "first light" rescues that put a powerful rescue force over the survivor just before dawn. These first light missions briefed at 3:30 AM, after a late-night planning effort. Crews went to bed, but many spent sleepless nights

---

[75] Richardson, *Vietnam Air Rescues*, 135.

knowing they were certain to face massed enemy guns in a few hours. Anticipating a tough mission as the lead Sandy pilot for an early morning rescue attempt, Richard Drury reviewed his mission notes endlessly, to the point "I was possessed of so many thoughts that I couldn't read the papers with any clarity." He fell asleep briefly, but when his alarm clock blared barely an hour later "it felt as if I hadn't slept at all, which was also about right."[76] Aircrews like Drury wrestled with their own fears and misgivings that put their sustaining motivation to the test.

Like flyers in the Air Force's other aviation communities, some admitted that they did not want to fly, but mastered themselves and did their duty, while a small number of men found their courage wanting and sought opportunities to avoid combat. Pararescueman George Schipper wrote that a pilot in his unit admitted "he was scared and didn't want to fly, but wanted to be a maintenance officer for the remaining two years until his retirement." Schipper noted "the whole outfit was aware of his feelings but he stayed on as [an aircraft commander]," presumably performing to an acceptable level.[77] George Marrett described three problem pilots within his twenty-five man Skyraider squadron, who had "turned tail." Like many jet fighter units, Marrett's commanders transferred these men to other units, one sent to train the Thai Air Force in T-28s.[78] The great majority of airmen suppressed their fears and found ways to press on. On the morning of his mission as lead Sandy, Richard Drury was so afflicted by "nearly unbearable" tension he stopped at the latrine on the way to his aircraft with a case of dry heaves. Despite his apprehensions, he was so committed to the mission he chose to ignore several malfunctions with his aircraft that were legitimate grounds for aborting. Drury had the plan in for the rescue in his

---

[76] Drury, *My Secret War*, 178.

[77] Schipper, *End of Tour Report*, 7.

[78] Marrett, *Cheating Death*, 177-179.

head and felt obligated to go, even though he had sufficient justification to turn around and hand off the mission to his deputy flight lead. "It was no time to be leaving on account of the peculiarities of a gauge…I was going for broke."[79]

The challenging problems presented by rescue missions energized an airman's internal desire for power, control and freedom, winning and recognition. There were few missions more demanding or more complex than a large rescue mission and as noted, there was no real standard playbook. The Sandys and Jollys had near absolute autonomy in figuring out how best to execute the rescue, which appealed to the aviator's desire to exercise control. The large armada of fighter, FAC, Sandy, and Jolly sorties committed to a contested rescue put immense firepower at the force commander's disposal, and he had the freedom to employ the forces as he believed were best. Perhaps the greatest largest appeal activated by a successful rescue was the aviator's desire to compete and win. To pull out a survivor was the ultimate "win" and the feedback was immediate.

Successful rescues earned recognition and praise from one's near peers, headquarters, and the general base population. Once a survivor made it onboard the Jolly, news flashed across the radios to affected bases and headquarters in Saigon. Upon return to base, two rituals reinforced the emotional satisfaction of a successful rescue. The first took place on the ramp at the Jolly Green recovery base (normally Danang, Nakon Phanom, or Udorn during Commando Hunt). Crowds of airmen, led by the wing's senior officers turned out to greet the survivor and congratulate the rescue force. Champagne, handshakes, and photographs of the survivors and their rescuers dominated the joyful event. HC-130 navigator Stephen Katz found it "really rewarding" to "land back at Udorn and then stand there in the flight line and wait for the

---

[79] Drury, *My Secret War*, 179-185.

helicopter to bring in the survivors" on a rescue he participated in. As an HC-130 crewmember, Katz seldom landed at the rescue recovery base, and felt fortunate to see the return. He recalled the "flight line [was] just lined with people and bottles of champagne everywhere. If they'd had a band the band would have been playing…the whole base just turned out for these two guys."[80] The whole base also turned out to praise their rescue force, of whom they were immensely proud.

If the survivor was physically able, he bought a round of drinks at the officer's club that evening for the rescuers. The Jolly crew credited with the save then replaced the previous tally of unit saves with the new number that included their efforts hung from a Jolly Green Giant doll in the officer's club bar. After satisfying their thirst, the assembled crowd invited survivors to recount their stories of "doubt, fear, and finally the thrill in being rescued and living to fight again." The celebration could become so exuberant that George Marrett recalled seeing one recovered Navy pilot "in a flight suit on the floor of the shower with cold water spraying on him. He was rolling back and forth, moaning, groaning, and calling out 'Throw me back, throw me back!' He may have acted like a fish, but he was a free man."[81]

Jolly crews won acclaim and respect, and the highest praise went to crews manning the low birds who actually went in for the pickup. When the HH-53 began to replace the HH-3, they often flew mixed missions together, but the HH-53 always flew high bird because its power allowed it to more easily lift the extra crew if the low bird went down. Albert Holcomb, the 3ARRG commander, reported that this inequity "created a morale problem among both H-3 and HH-53 pilots."[82] Presumably the HH-3 crews assumed greater risks, while the HH-53 crews were

---

[80] Katz, interview, 30.

[81] Marrett, *Cheating Death*, 76.

[82] Holcomb, *End of Tour Report*, 7; Smith, *End of Tour Report*.

denied the glory and praise for making combat saves. Some thought that the Jolly Green Giant crews received more than their fair share of recognition. The Sandys were also greatly appreciated but some A-1 pilots believed they did not get the recognition they deserved because they did the dangerous work of clearing the way for the helicopters. A pair of Sandy pilots wrote a song, "Sandy Cannon Ball" in 1968 that captures this sentiment. The final verses recount a successful return to Nakon Phanom (NKP):

Headed back to NKP, Compress is on the air
JSARC, King, and Blue Chip too are singing praises there
Sandys set the whole thing up to answer a pilot's prayer
Jollys had the photog out to keep their record clear
The success of the mission was Sandys all the way
Their fighting bombing and strafing saved the day
Sandys were the heroes, but Jollys got the cheer
Hell it doesn't matter, so hang it in your ear[83]

That praise went to the helicopter crews facing the greatest risks also affected morale in the HH-43 local base rescue units. By the end of Commando Hunt, the HH-43 units passed the majority of the difficult rescues to the Jolly Green Giants. Stephen Sutton commanded a unit of both helicopters at Danang in 1972 and wrote "Compared with the Jolly Green pilots, the HH-43 Pedro pilots were rarely in the spotlight and the missions they did perform were usually much less glamorous. This situation resulted in occasional low morale among the Pedro aircrews that had to be overcome by insuring that they were involved in and sharing the success of the Jollys."[84] HH-43 pilot Willis Thayer was particularly distressed by the number of decorations awarded in some rescue units, and complained "many decorations have been cheapened, and it personally no

[83] Marrett, *Cheating Death*, 120.

[84] Sutton, *End of Tour Report*, 2.

longer means much to me when I hear the often used phrase "3rd ARRG is the most decorated unit in the AF."[85]

The Air Force heaped official recognition on rescue crews. Nearly half (six) of the Air Force's thirteen Medals of Honor went to airmen participating in rescue operations. The Air Force's first award went to an A-1 pilot, Maj Bernard Fischer for landing in the A Shau valley to pull out his wingman. Another A-1 pilot, Col William Jones earned the Medal of Honor as a Sandy over North Vietnam in 1968. Three helicopter aircrew members, pilots Capt Gerald Young and 1Lt James Fleming, and pararescueman A1C William Pitsenbarger earned Medals of Honor on rescue missions. Lt Col Joe Jackson, a C-123 pilot, was decorated for pulling the last three Americans out of Kham Duc. In 1967, *Airman Magazine* began running short biographical articles on airmen awarded the Air Force Cross, and Jolly Green pilots and PJs figured prominently in several issues. The Air Force Cross was established in 1960 and was "awarded for extraordinary heroism, not justifying the award of a Medal of Honor."[86] Across the entire war in Vietnam, the Air Force awarded one third of all Air Force Crosses (62 of 181) to airmen involved in rescue missions. As the war shifted from Rolling Thunder to Commando Hunt, the predominance of Air Force Cross awards shifted from strike and Wild Weasel crews to rescue crews indicating shifting institutional priorities. At the peak of Rolling Thunder in 1967, half of the Air Force Crosses awarded (twenty-seven of fifty-five) went to strike pilots and Wild Weasel crews. Slightly over one quarter of the awards (fifteen of fifty-five) went to airmen involved in rescues. Over the Commando Hunt's three and a half years, 60 percent of the twenty-eight Air Force Crosses recognized rescues. The shift from recognition of strike crews to rescue crews

---

[85] Thayer, *End of Tour Report*.

[86] U.S. Air Force Personnel Center, "Fact Sheet: Air Force Cross," accessed March 31, 2010, http://www.afpc.randolph.af.mil/library/factsheets/factsheet.asp?id=7726.

suggests a shift in Air Force priorities—from winning the war against Hanoi to preservation of airmen.

At the local level, rescue squadrons provided a close external environment that recognized and encouraged rescue crews. As already noted, the helicopter squadron at Nakon Phanom hung a Jolly Green Giant doll in the bar with the unit's cumulative rescue tally around its neck. Successful rescue crews got to change the sign with the new tally. The squadron's cumulative rescue count prominently put the unit's purpose and most valued activity on display for internal and external audiences. William Harris closed his end of tour report as squadron commander with his units' saves "the 37th Aerospace Rescue and Recovery Squadron made 222 Saves of which 199 were combat saves. I give full credit to the success of our mission to the tremendous people that made up the team and gave so unselfishly of themselves to make every save possible."[87] As squadron commander, Albert Holcombe used the Jolly Green Giant icon and the rescue count to build unit identity. "Our squadron 'Jolly Green' signs with the number of saves listed on them has proven to be a source of pride for all squadron personnel. The painting of green footprints on shirts, sidewalks, and etc., continues to give a large boost to squadron morale."[88]

Squadrons built on the Aerospace Rescue and Recovery Service's powerful motto "That Others May Live."[89] Empathy for an unknown airman, of any service, stranded in hostile territory, provided a powerful sense of purpose in a war that provided ample frustrations. All who took part in a successful rescue found profound satisfaction in succeeding at an unambiguous and

---

[87] Harris, *End of Tour Report*, 5.

[88] Holcomb, *End of Tour Report*, 20.

[89] Tilford, *Search and Rescue in Southeast Asia*, 19.

incredibly difficult task. Rescue forces acted on a sense of duty towards a fellow combatant, engaging ties to the community of all American airmen. Although hotly contested rescues led to losses within the rescue force, which mandated the rescue force pick up some of their own, the vast majority of operations were to rescue a stranger—any American warrior trapped in hostile territory. Airmen felt and acted out of kinship to the collective body of American aviators. George Marrett referred to the F-4 pilot (whom he did not personally know) as "a flying buddy."[90] Aviators from many bases, often unknown to each other, formed up over a survivor to cooperate in a rescue mission, and valued that sense of purpose and cooperation. Richard Drury admired his fellow rescue pilots and drew pride from the rescue mission "There was no denying the warmth and greatness involved in men who rolled out of bed to rescue another human being and fly yesterday's aircraft across a land that attempted to kill them every minute." He took it as a mark of personal pride to be part of a rescue, a mission he considered "the last noble role we had"[91]

---

[90] Marrett, *Cheating Death*, 77, 171, 193.

[91] Drury, *My Secret War*, 169.

Conclusion: Technology, Motivation, and War in the Air

At twelve noon, August 15, 1973, a formation of four Nail OV-10 FACs exited northern Cambodian airspace and began their return to Ubon Air Base, completing the last American combat sorties of the war. An hour earlier, FAC Darrel Whitcomb put in airstrikes by F-4s from Ubon and A-7s from Korat to support Khmer Army troops outside the besieged capital city, Phnom Penh. "The ground commander was most appreciative of the support and asked for more" which Whitcomb had to refuse; there were no more American sorties coming. Lt Col Howie Pierson, Whitcomb's commander later wrote that the call from the ground that last day: "No can help…we die now!" still "echoes in [his] heart today." To the bitter end, airmen felt the obligation to use the immense power of their aircraft to help fellow combatants on the ground. After guiding the last strikes, Whitcomb paused to do some aerobatic maneuvers over the capital, followed by a join-up with the other three Broncos. Approaching Ubon, the pilots joined into a crisp show formation for a full power entry into the traffic pattern and a landing in front of the base population. The aerobatics were a final, sad farewell salute, but also a personal reminder of the freedom of and joys of flight amidst the tumult of war. The formation return, (rare for normally solitary FACs), was a public demonstration of the pride these men took in flying their machines with the utmost in skill and precision.[1]

---

[1] Howie Pierson, "A Bittersweet Moment in American History," in *Cleared Hot: Forward Air Controller Stories from the Vietnam War*, vol. 2 (Forward Air Controllers Association, 2008), 528-530; Darrel Whitcomb, "A Footnote to the Vietnam War," in *Cleared Hot: Forward Air Controller Stories from the Vietnam War*, vol. 1 (Forward Air Controllers Association, 2008), 512-514.

This dissertation has argued that throughout the war, the power, control, and freedom of military aviation provided a central foundation of internal motivation for Air Force aviators. As American strategies and attitudes towards the war changed, these basic attributes of motivation remained, as did their closely-related corollaries of obligation, flying excellence, competition, and recognition. To operate powerful technology was intrinsically satisfying to these men, but controlling that power obligated them to help fellow warriors to fight, win, and to live to fight another day. External ties to fellow combatants added meaning and additional motivation. When present, emotional ties spurred action, but they could also provoke challenges to mission-limiting rules imposed by seemingly disconnected, emotionless, and unreasonable superiors. American aviators chafed at infringements on their autonomy and freedom, and believed that their front lines perspective and highly-developed flying skills made them most qualified to decide how to best accomplish a combat mission and come back alive. An aviator's flying skills largely defined his standing within the flying community, which continually reinforced the desire to be the best.

Both sides introduced new technologies throughout the war, which altered the risks American fliers encountered in the skies over Southeast Asia. The Air Force's technological improvements far outpaced Vietnamese developments, and reshaped the motivational environment by making American aircraft, weapons, and crews more lethal and less vulnerable to enemy defenses. As dangers and losses slowly declined over the last half-decade of the war, the technologies that helped reduce those dangers altered the degree of power, control, and freedom available to Air Force fliers. Aircraft and weapons became more powerful, but also more complex, mandating the addition of skilled and technically proficient electronic warfare officers and weapons system officers to fighter crews, which led to an accommodation through a shared form of control in a traditionally single-seat culture. Fighter pilots also surrendered individual autonomy to fly in tightly packed bomber formations in the closing months of Rolling Thunder

(and four years later throughout the Linebacker Offensives) to maximize their radar jamming and simplify their Wild Weasel and air-to-air support over North Vietnam. Technology also decreased the risks of combat flying, which in turn, reduced the personal honor to be won by flying over enemy territory and a retreat from the apex of the honor culture epitomized by the 100-mission patch.

* * *

Eight years before the Nail's last futile mission over Cambodia, American airmen opened Operation Rolling Thunder with great optimism, self-confidence, and esprit. Air Force pilots flew their powerful and sophisticated fighters into the dangerous skies of North Vietnam confident in themselves, their machines and in victory. Airmen wanted to do their part to win the war by hurling America's military might against the heart of the communist regime in Hanoi. Although Air Force aviators flew well and bravely, they gradually sensed that their leaders were unwilling or unable to fight North Vietnam in a way that they believed would lead to victory. During the campaign against the North, wing and squadron commanders faced a difficult challenge restraining their high-spirited fighter crews, who were eager to fight to win. But by the time Operation Commando Hunt ended in early 1972, few airmen expressed any hope that their actions over Laos were helping to bring the war to a successful conclusion, so they were willing to fly with greater caution than displayed at the opening of Rolling Thunder. When crews lacked the ability to see how their efforts were making progress towards winning the war, they derived personal satisfaction from the joys of flying by controlling powerful machines, using their skills to accomplish complex and demanding tasks, applying that power and their skills to support others, and to win reputation among their peers.

But few aviators experienced the fullest measures of power, control, and freedom they might have desired because they had to contend with limitations of their aircraft, mission, and crew position. Forward air controllers, for example, enjoyed considerable autonomy and freedom in their small underpowered spotter aircraft, but flew the least powerful aircraft. SAC bomber crews operated the war's most powerful aircraft due to their size and payload, but enjoyed no freedom due to SAC's zealous regimentation. Air Force navigators and electronic warfare officers exercised a limited degree of control that varied by their unique expertise and how necessary their contributions were to the mission. Many found enough internal satisfaction in their assigned roles; others sought greater measures of power, control, or freedom by volunteering for more dangerous, but satisfying, missions and aircraft. For example, electronic warfare officers in the B-52 exercised very little control or influence in the relatively safe skies of Laos and South Vietnam, but those who transferred into fighter back seats as Wild Weasels catapulted ahead in internal satisfaction, because fighter EWOs ran the SAM-hunting mission and the success or failure of large strike forces hinged on their unique expertise. Wild Weasels, jet forward air controllers (including the Misty FACs who flew aging two-seat F-100Fs), and air-to-air crews were among the war's most motivated because they experienced the war's highest degree of all three (power, control, and freedom) as they hunted SAM sites, elusive ground targets, or enemy fighters from their powerful fighters. This also helps account for why the morale of the Wild Weasels and Misty FACs was so high despite their high losses.

Risk was a constant backdrop for Air Force aviators; it was intrinsic to both flying and fighting, and added to the excitement and internal satisfaction they derived from flying. Ed Cobleigh noted a gradual acclimatization to risk throughout a young aviator's training, and observed that combat flying could create a "chemical addiction as you become fonder and

fonder" of the adrenaline that accompanies danger in battle.[2] But Air Force aviators were not reckless daredevils; they drew confidence from their training and highly developed flying skills, which they believed enabled them to prevail over systems failures, poor weather, darkness, and the enemy. C-130 pilots like David Vaughn had to draw upon all their skills as professional aviators to get their sixty-ton aircraft on the ground and stopped on Vietnam's tiny dirt runways, and saw success as a validation of their skills. Many airmen applied the same idea against the enemy, in a belief that their highly refined flying skills could prevail against an enemy equipped with missiles, anti-aircraft guns and MiG fighters.

Airman believed that by seeking perfection they could prevail over risk. Flying skills, as assessed by the Air Force's Human Resources Lab in 1970 increased steadily through one's first thirty sorties in combat, so inexperienced airmen tried to survive long enough to learn from their mistakes and avoid repeating the mistakes of others.[3] Ken Bell rationalized losses among his fellow F-105 pilots to a lack of professionalism, teamwork, decisiveness, or conformity on their parts. But this attitude had its limitations; when poor flyers died, it seemed understandable, but when good flyers died, as often happened in Route Pack Six, it seemed likely that good airmanship and planning could only influence the odds and not control them.

Tactically sound plans devised by imaginative leaders, backed by solid airmanship, could favorably influence the toughest odds in battle, so airmen had a strong interest in securing enough autonomy to freely tailor their tactics in response to the changing conditions of battle. This also led to a meritocracy in the air, in which the best pilot—not the oldest or highest ranking, led

---

[2] "You learn to relish fear, anticipating the shot of adrenaline that follows." Cobleigh, *War For the Hell of It*, 53.

[3] Shore et al., *Proficiency Differences of Pilot and Navigator F-4 Second-Seat Crewmembers: A Southeast Asia Evaluation*, 5-6.

missions in the best flying units. The life and death consequences of aerial combat dictated that the best aviators should lead regardless of rank, and in many Air Force flying communities, this was generally true, which bolstered morale. At the height of Rolling Thunder in early 1968, Col David Winn recounted that at Takhli, "we had more majors that were qualified to lead a force to Hanoi than we had colonels."[4]

An airman's ability to control risk was often limited by higher headquarters directives, which presented an exasperating motivational challenge. Conflicts with headquarters over limitations were inevitable, given the highly restrictive rules of engagement. Two very different groups—Arc Light's B-52 crews and Rolling Thunder's F-105 pilots—lacked substantial autonomy and adopted different means to cope with that reality. B-52s were regulated by SAC oversight to the point that crews chose to pass notes around the flight deck to conceal deviations from the routes and practices assigned by headquarters. The F-105s were so tightly constrained by airspace and target restrictions that a squadron commander likened his pilot's plight like that of a barn swallow being fired on while trapped in a small room.[5] Although the bomber and fighter communities lacked the degree of flexibility the crews desired, the dangers they faced led to differing resolutions. The bomber crew's distance from other combatants, negligible losses, and general lack of emotional content in their war allowed SAC crews to willingly accept SAC's exacting directions across the seven years of Arc Light. Only in the final two weeks of the war, when B-52s flew against the center of Hanoi, did the bomber crews challenge SAC's authority. When crews believed that SAC's detailed control caused undue B-52 losses, emotions boiled up and a groundswell of aircrew discontent forced SAC to relinquish control of tactics to local

---

[4] Winn, interview, 108.

[5] Baughn, interview, 74-75, 129.

commanders.[6] Thud pilots, on the other hand exercised as much local control as they could wrest from the rules of engagement, and relied on honor to strongly supplement flight's basic appeals. Powerful emotions stirred by danger, fear, and the loss of friends in Rolling Thunder motivated men to fight but threatened the authority of military discipline as some crews chose to violate the rules of engagement. Similarly, FACs in the South, stirred by connections to soldiers on the ground, routinely violated altitude and safe ordnance distance rules to provide effective close air support.

The power airmen controlled activated a sense of obligation, exemplified by Col Ralph Parr's hasty explanation to his back-seater as they dove their damaged F-4 into a cauldron near Khe Sanh: "we are the only ones with napalm to do the job. We have to go back in."[7] Personal connections powerfully reinforced that sense of obligation. External connections ranged from close relationships between squadron-mates to the most tenuous and distant ones, but which still added meaning. "Pardo's Push" was one of the most prominent examples of a squadron-mate risking his own life for a friend when Bob Pardo used the base of his own windshield to push Earl Aman's F-4 to a safer bail-out over Laos. But memoirs and oral histories are also full of brief but meaningful external linkages to fellow combatants who were unknown before, during, and after a battle. Even the most tenuous linkages could add significant meaning and purpose to a routine mission. When Jim Hooppaw heard indirectly (through a fighter pilot's radio calls) that his B-52 bomb load might be able to help a group of friendly soldiers survive a desperate battle, that mission became his most meaningful. "We led the cell in and listened to the pickup after we laid

---

[6] The definitive account of B-52 crew behavior in Linebacker II has yet to be produced, although various accountings range from a "mutiny" to "grumbling." Clodfelter, *The Limits of Air Power*, 192-193; Marshall L. Michel, *The Eleven Days of Christmas: America's Last Vietnam Battle* (San Francisco, CA: Encounter Books, 2002), 174-178, 224-225; Zentner, *The Art of Wing Leadership and Aircrew Morale in Combat*, 80-89.

[7] McManus, "Forty Minutes at Khe Sanh," 241-243.

down the strike. The guys on the ground got out. It was the most satisfying mission I ever flew. The results were immediate and we knew we had helped some guys in deep trouble."[8]

Mere proximity, however did not assure a motivating personal connection. C-130 crews flew so many missions a day, they often did not tie much significance to the constant turnover of people and cargo in the back of their aircraft, as they struggled with weather, primitive infrastructure, and sometimes balky aircraft to adhere to a hectic daily schedule. Some intentionally distanced themselves from the war, as in the case of hauling body bags, but like the other communities of flyers, small personal connections made missions very relevant, spurring crews to take substantial risks. After talking to the physician at Pleiku, navigator Richard Marks directed his pilots to a hazardous landing to help a wounded soldier. Marks recalled he took such a risk, his hands shook so hard he could not light a cigarette.[9] Such external ties, whether to men on the ground or to other aviators, strongly supplemented the base of internal motivations.

Men who carried out their flying duties skillfully and courageously earned the respect of fellow aviators. Fliers' competitive natures led to continual comparisons and mutual surveillance which cultivated an honor culture. To Jim Hooppaw, a public display of good piloting skills in the B-52 could be a source of personal pride, while poor flying detracted from one's self image and the attitudes of those around him. "Failure to live up to one's own expectations can be devastating. The word gets out as well. We all knew pilots who failed to make the grade." Before his first Arc Light mission Hooppaw worried more about failing to refuel his bomber—a potential personal failure—than any external hazards. "Pilots can be very egotistical. The things which BUF drivers like to show they can do well are landing and refueling. Especially refueling. Not to

---

[8] Hooppaw, *Where the Buf Fellows Roamed*, 215.

[9] Marks, interview, 34-36.

be able to get the gas is looked upon as a shameful thing."[10] To falter in one's flying skills or one's courage was viewed as unmanly. When Wild Weasel Mike Gilroy's wingman questioned his plan to hunt SAMs in Route Pack Six, and then lost sight of his leader and ran to the relative safety of Thud Ridge, Gilroy feminized him by calling him a "candy ass."[11] Honorable behavior affirmed ones masculinity in the eyes of one's peers and reinforced one's self-image. Many of those who fell short were ostracized through reassignment from the flying squadrons to a wing staff or the Seventh Air Force staff in Saigon.

Confronting great risks with courage conferred great honor; in Rolling Thunder, the 100-mission patch became the ultimate badge of honor. Exposure to danger conveyed status, and was a justification for aviators' privileged status within the Air Force. There were frictions between communities of flyers over the degree of honor due each group, and those who endured the greatest risks sought to keep recognition selective and exclusive. F-105 pilots at Korat began awarding 100-mission patches in 1965, they rapidly became the ultimate sign of achievement within the fighter community. Other Air Force flying communities quickly mimicked the patch, to the chagrin of the F-105 pilots, who saw copycat patches as unjustified infringements on their honor. Ken Bell recounted a fight between fighter and bomber crews at the officers club on Guam over the right to wear a 100-mission patch. Bell's flight leader, a veteran of one hundred F-105 missions "walked over to a guy sporting a '100 Missions: South Vietnam: B-52' patch on his flying suit. 'That patch offends me,' Vic said in a loud voice. 'How dare you compare a B-52 mission over South Vietnam with a mission north in the F-105!' In a flash, tempers flared and we

---

[10] Hooppaw, *Where the Buf Fellows Roamed*, 129, 177-179.

[11] Gilroy, "Single Ship Iron Hand," 168, 175, 177.

were in a hell of a fracas."[12] The men who flew over South Vietnam and Laos accumulated hundreds of missions at far lower risk than the F-105 pilots experienced over Route Pack Six. Two or three hundred missions were not uncommon milestones for crews in South Vietnam, but these milestones lacked the prestige afforded those who survived one hundred missions over the North. Honor was necessarily a powerful motivator for Rolling Thunder crews who faced the highest risks, suffered high losses, and believed their efforts were being wasted by counterproductive political restraint.

Technological changes on each side affected the relationship between mission and risk throughout the war, which in-turn affected motivational challenges. North Vietnam's introduction of the SA-2 surface-to-air missile in July 1965 and the advanced MiG-21 in January 1966 created significant tactical problems until Air Force crews learned how to understand and counter these emerging high-technology threats. Elevated losses caused by these new enemy systems and fear of new, powerful enemy capabilities generated fear and anxiety until the Air Force responded with tactical and technical improvements to regain technological ascendancy. Massive research and development efforts yielded at least 116 new Air Force systems introduced into combat in 1966 and 1967.[13] By the end of Commando Hunt in 1972, massive American investments in technology had far outpaced North Vietnam's and its communist bloc backers, which enabled American aircrews to succeed in accomplishing their missions at lower risk, which then decreased motivational challenges. This was an immensely positive development, but it unfolded within the context of a stalemated strategy and growing discontent at home. These coalesced in a

---

[12] Bell, *100 Missions North*, 29.

[13] *USAF Plans and Policies R&D for Southeast Asia 1965-1967* (Office of Air Force History, United States Air Force, 1969), Appendix 3, Historical Research Agency, Maxwell AFB, AL.

diminished requirement to take risks (due to the technology) and diminished reason to do so (due to the context), so crews tried to enjoy the flying when they could, but put their honor on the line and fought hard to save one another when the need arose.

Technology and the strategic setting adjusted the limits of control and shifted the highest honors from strike crews to rescue crews. In response to the lower risks, all fighter tours became one year long, which realigned the fighter crews with aircrews fighting the in-country war. Decreased risks also led to a retreat from the zenith of the honor culture embodied by the 100-mission patch. Honor still meant a great deal to aviators, who still highly valued the good opinion of the men around them, but it subsided for fighter crews when compared to its necessary prominence in Rolling Thunder. Awards of the Air Force Cross indicate a transition, between Rolling Thunder and Commando Hunt, in the Air Force's most honored communities and a shift in the opportunities to demonstrate noteworthy heroism. At the peak of Rolling Thunder in 1967, 27 percent of fifty-five Air Force Crosses went to airmen involved in rescues. Over the Commando Hunt's three and a half years, 60 percent of the twenty-eight Air Force Crosses presented recognized rescues.

During Commando Hunt, aircrews still craved the power, control, and freedom of military aviation, and many found a great deal of freedom to apply their renewed firepower along the Ho Chi Minh Trail. Gunship crews employed their powerful cannons against the PAVN's trucks, and were granted a high degree of autonomy to hunt trucks within their assigned sectors. Fighter crews coveted assignment to jet FAC duties, which afforded them similar freedoms to roam the Trail in daylight, and hunt for the enemy in "clean" fighters unencumbered by heavy bomb loads, which enhanced their aircraft's speed and maneuverability. Despite these newly regained freedoms, control changed within the cockpits and flight decks, especially in two-seat F-4 cockpits. Crews flying in Commando Hunt shared control more collectively within their aircraft

than in the past. The troika of the pilot, navigator, and fire control officer within the gunship exercised a form of collective leadership that allowed control to migrate during different phases of the mission. The F-4 became the Air Force's predominant fighter after Rolling Thunder, replacing the single-seat F-100 in South Vietnam and the F-105 in Thailand. After 1969 weapons systems officers replaced the frustrated pilots in the back seat of the F-4 Phantoms, and brought more relevant systems expertise to the back seat job. Weapons systems officers became technical experts which afforded them the opportunity to make a bigger contribution to the mission, and who were satisfied with a share of collective control unlike their unhappy pilot predecessors.

After the war, American airpower technology continued to outdistance that of America's competitors and their clients. Increasingly powerful computing technology mated with new airframes and a new generation of powerful jet engines. Even the stalwart and long-serving B-52 benefitted from a digital avionics makeover. The F-4 followed the F-105 into retirement in 1996, superseded by a new generation of fighters dominated by the single-seat F-15, F-16, and A-10.[14] Those aircraft and host of others including the stealth fighter and bomber joined the indomitable B-52 and C-130 in wars over the Middle East and Balkans, in which American airpower played a dominant role. Steady progress in military aviation technology gradually altered some of the motivational terrain for USAF airmen, especially the pilots. Guided weapons replaced unguided bombs throughout the 1990s. Laser guidance eliminated the need for the exacting and risky diving attacks used over Hanoi three decades earlier, although the crews needed to skillfully plan their attacks and keep the laser pod aligned with the target to achieve a hit. By the end of the decade, the Air Force deployed the Joint Direct Attack Munition (JDAM), a bomb that used

[14] "Boeing: News Feature - F-4 Phantoms Phabulous 40th," accessed October 17, 2010, http://www.boeing.com/defense-space/military/f4/.

satellite guidance to land within ten meters of target coordinates with 95 percent reliability.[15] This kind of information technology, integrated into a weapon, delivered unprecedented precision and the ability to accurately hit many targets with a single aircraft. Dropping a JDAM, however became a relatively simple flying task. The pilot flies over the target at high altitude, ensures the correct coordinates are entered into the fire control computer, and drops the weapon after verifying the target is in range. Fighter crews certainly appreciated the ability to hit accurately in all-weather from a high-altitude sanctuary, but some felt a loss with fewer opportunities to demonstrate the superior airmanship needed to put a less sophisticated weapon on target. A pair of F-16 pilots registered this sentiment with the 2003 song "JDAM Blues":

> *Yea there once was time, Viper [F-16] pilots were Gods*
> *Lazing [aiming with a laser] LGBs, in their targeting pods*
> *It was fairly tasking, not to overfill your cup*
> *But if you weren't on your game, you could still screw it up*
> *Yea those days are all disappeared, the Anti-Christ is finally here*
> And it's JDAM, Dropping JDAM…[16]

Risks to American crews decreased steadily due to the incorporation of more capable standoff weapons, information, and stealth technology. A 1996 raid on Iraq prominently featured a pair of Air Force B-52s that launched thirteen cruise missiles from scores of miles from Iraqi airspace. A small cohort of radar-evading stealth fighters and stealth bombers joined their place with other Air Force aircraft in 1983 and 1997 respectively.[17] When handled properly along well-planned routes, these aircraft enabled Air Force crews to operate within enemy air defense networks, since 1991, at the cost of only one stealth fighter lost to a Serbian surface-to-air

---

[15] Air Combat Command Public Affairs Office, "Fact Sheets: Joint Direct Attack Munition GBU- 31/32/38," accessed October 17, 2010, http://www.af.mil/information/factsheets/factsheet.asp?id=108.

[16] First and third verses reproduced here. "JDAM Blues" Raymond, *Live at the Sand Trap*.

[17]U.S. Department of Defense, "News Release: B-2 REACHES INITIAL OPERATIONAL CAPABILITY," accessed October 18, 2010, http://www.defense.gov/releases/release.aspx?releaseid=1202.

missile in 1999. Further advances in information technology enabled the fielding of highly-capable unmanned drone aircraft, the RQ-1 Predator, RQ-4 Global Hawk, and the MQ-9 Reaper. These aircraft have allowed teams of pilots, sensor operators, and intelligence analysts to operate them via satellite from secure bases in the United States eight thousand miles from theaters of operations in the Middle East and Central Asia.

Unmanned aircraft have been in great demand in counterinsurgency and counterterror operations and the Air Force has accelerated the retirement of the F-15 and F-16 generation of fighters to help "man" these new systems. These systems have the potential to force the greatest changes to traditional Air Force aircrew motivations in that many of the internal motivations intrinsic to flight are eliminated by these systems. Current generations of unmanned aircraft have little power, since they are designed for endurance and are very lightweight. Because they are controlled remotely, their crews do not directly experience the relatively frail aerodynamic power embodied in the current generation of unmanned drones. Aircrews exercise control through an autopilot and satellite linkages, and where and how they fly is tightly monitored by multiple higher headquarters over multiple channels of secure internet "chat." These same chat channels establish the ties between the drone crew and those they are supporting on the ground through an unfolding string of text on computer terminals. Those connections to American troops on the ground may have the greatest positive motivational potential for drone crews if they can help those troops by detecting the enemy over the next hill or providing a warning of a roadside bomb ahead. Drone positions and sensor video are piped into military command centers around the world, and are subject to the direct scrutiny of flag officers during critical events. The biggest challenge to drone crews is the loss of freedom. Pilots converted from fighters, bombers, and transports to fly drones from air conditioned booths in the Nevada desert are far removed from

the freedom of flight they experienced in their previous weapons systems. A pair of songs by F-16 pilots lamented their assignment to Predators ("Preds"):

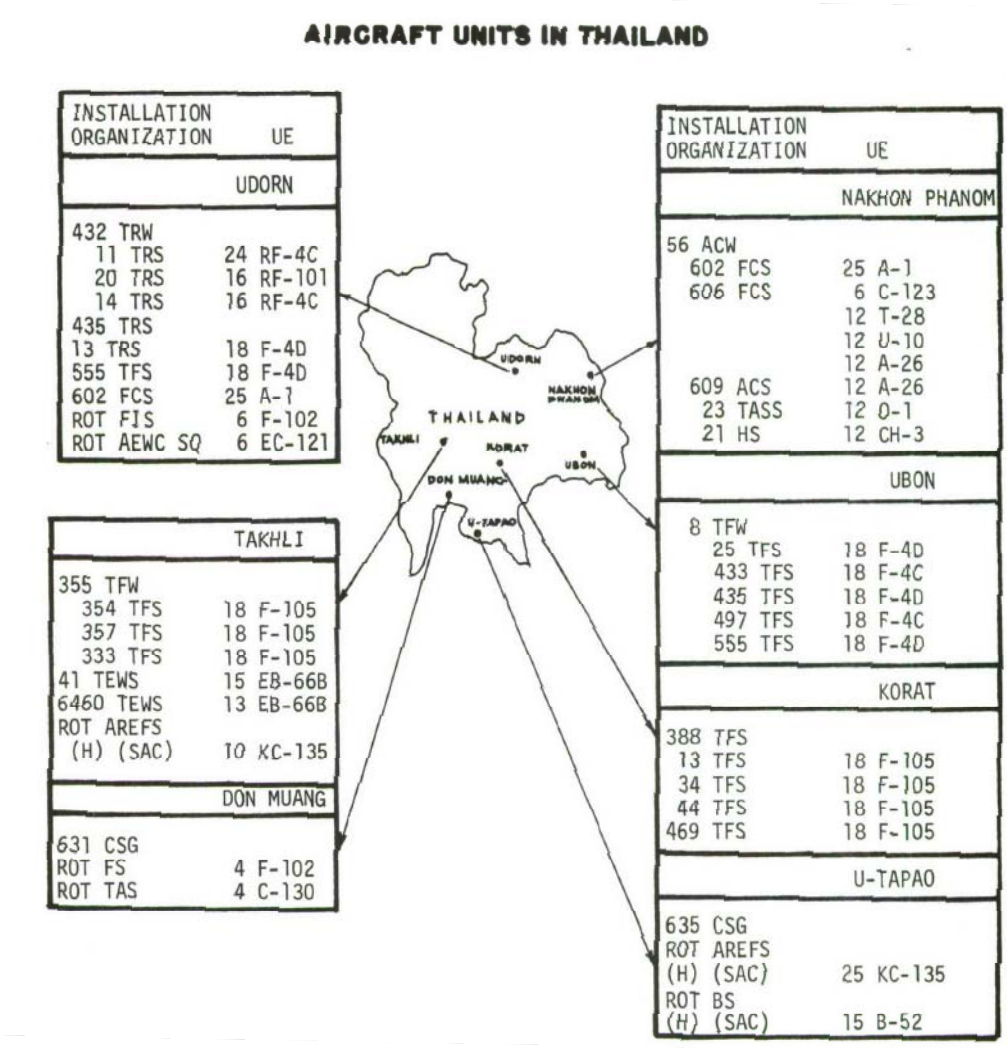
> *They said this was a good deal*
> *but they don't really understand*
> *From a one G perspective,*
> *I didn't want to go to Preds,*
> *so they sent me non-elective*
> *You know, I used to fly in the sky,*
> *flyin' so high,*
> *now all I do is I sit and I cry…*[18]

Although drones are not planned to replace the majority of the Air Force's manned aircraft, a sizeable portion of the Air Force's force structure is shifting to unmanned systems, which in turn is likely to force a major shift in the culture of the flying community. With fewer opportunities to experience the power, control, and freedom of military aircraft, and the loss of the risks and its attendant honor, Air Force aviators are likely to lose the privileged status they enjoyed within the Air Force since its inception in 1947. The implications are that unmanned crews of pilots, sensor operators, and intelligence analysts may turn to the motivations closer to those of the navigators, electronic warfare officers, and enlisted crew members of southeast Asia; their internal motivation will shift to one based on shared control and a pride in unique contributions based on unique expertise, and internal motivation based on power, control and freedom will subside.

---

[18] *One G - Predator Drivers (Once Upon a Time Fighter Pilots)*, 2009, accessed October 18, 2010, http://www.youtube.com/watch?v=K5YD3BZO7Ys&feature=youtube_gdata_player.

Appendix 1: U.S. Air Force Order of Battle, 1967



U.S. Air Force Aircraft Units in Thailand[1]

[1] "UE" meant "unit equipped," which was the official authorized strength of an air unit. Units might have additional spare aircraft or fewer depending on losses and maintenance. " Bonetti, *The War in Vietnam, January - June 1967*, 15, Figure 1.

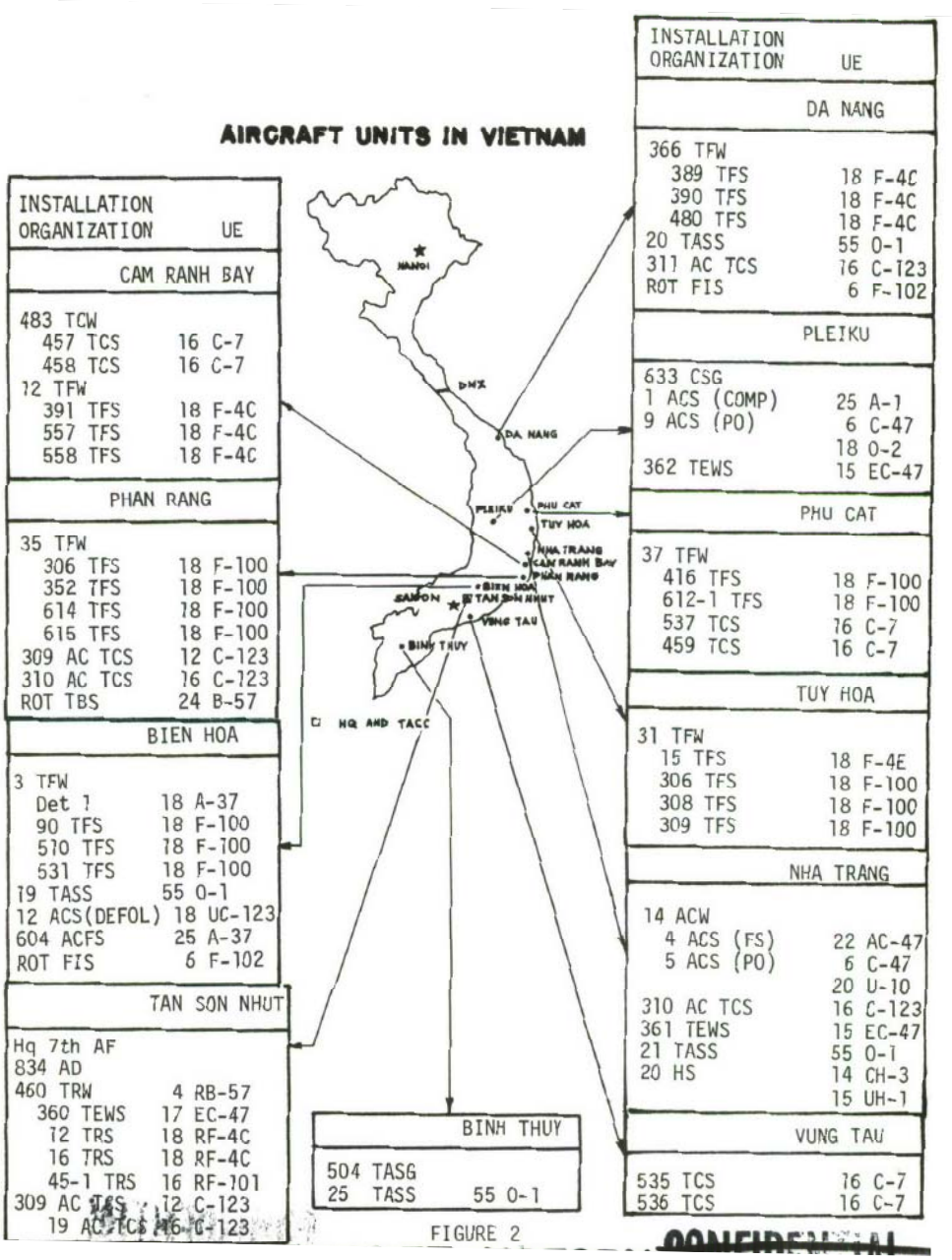


FIGURE 2

U.S. Air Force Aircraft Units in South Vietnam[2]

[2] Ibid., Figure 2.

Bibliography

Bibliography

Oral Histories

Alpers, John. Interview by Dr. James C. Hasdorff, May 8, 1992. Air Force Historical Research Agency, Maxwell AFB, AL.

Anderson, Col William. Interview by Stephen Maxner, September 22, 2000. The Vietnam Archive, Texas Tech University.

Anderson, Lt Gen Andrew B. Interview by Hugh N. Ahmann, November 3, 1986. Air Force Historical Research Agency, Maxwell AFB, AL.

Anthis, Maj Gen Hollen H. Interview by Maj Dean S. Gausche and W. R. Grainger, August 30, 1963. Air Force Historical Research Agency, Maxwell AFB, AL.

———. Interview by Maj Samuel E. Riddebarger and Lt Col Valentino Castellina, November 17, 1969. Air Force Historical Research Agency, Maxwell AFB, AL.

Appleby, CMSgt Jerald. Interview by Hugh N. Ahmann and David Metz, January 28, 1988. Air Force Historical Research Agency, Maxwell AFB, AL.

Artley, Capt John C. Interview by Joseph W. Grainger, February 23, 1963. Air Force Historical Research Agency, Maxwell AFB, AL.

Atchison, Maj Richard M. Interview by Lt Col Robert G. Zimmerman, July 16, 1975. Air Force Historical Research Agency, Maxwell AFB, AL.

Ayres, Timothy R. Interview by Dr. James C. Hasdorff, October 17, 1991. Air Force Historical Research Agency, Maxwell AFB, AL.

Barth, Lt Col John C., Maj James Thomas, and Capt Gerald McAllister. Interview by Lt Col J. A. McGee, November 9, 1970. Air Force Historical Research Agency, Maxwell AFB, AL.

Bates, Richard Lyman. Interview by Vera Clayburn, May 28, 2005. Veterans History Project. Library of Congress.

Baughn, Brig Gen Richard M. Interview by Hugh N. Ahmann, March 20, 1979. Air Force Historical Research Agency, Maxwell AFB, AL.

Beck, Maj Gen Stanley C. Interview by Lt Col Walter R. Berg, January 14, 1988. Air Force Historical Research Agency, Maxwell AFB, AL.

Bedke, Maj Gen Ernest A. Interview by Lt Col Douglas G. Lamb, January 25, 1988. Air Force Historical Research Agency, Maxwell AFB, AL.

Beekman, William D. Interview by Dr. James C. Hasdorff, June 19, 1991. Air Force Historical Research Agency, Maxwell AFB, AL.

Belli, Lt Col Robert E. Interview by Maj Lyn R. Officer and Hugh N. Ahmann, January 29, 1973. Air Force Historical Research Agency, Maxwell AFB, AL.

Bishop, Brig Gen Cleo M. Interview by Lt Col John N. Jr. Dick, July 7, 1976. Air Force Historical Research Agency, Maxwell AFB, AL.

Black, Lt Col Jon D. Interview by Dr. James C. Hasdorff, August 1, 1991. Air Force Historical Research Agency, Maxwell AFB, AL.

Blake, Lt Col Charles R. Interview by Lt Col Ray L. Bowers, May 6, 1970. Air Force Historical Research Agency, Maxwell AFB, AL.

Blesse, Maj Gen F.C. "Boots". Interview by Lt Col Gordon F. Nelson, February 14, 1977. Air Force Historical Research Agency, Maxwell AFB, AL.

Bliss, Ronald G. Interview by Dr. James C. Hasdorff, October 17, 1991. Air Force Historical Research Agency, Maxwell AFB, AL.

Blood, Maj Gen Gordon F. Interview by Maj Samuel E. Riddlebarger and Maj Richard B. Clement, April 6, 1970. Air Force Historical Research Agency, Maxwell AFB, AL.

Boese, Lt Gen Lawrence E. Interview by Douglas McDonald, March 28, 2004. Adams Center, Virginia Military Institute.

Boling, Fred Wayne. Interview by Kim Sawyer and Stephen Maxner, November 16, 2000. The Vietnam Archive, Texas Tech University.

Borders, Col Charles W. Interview by Col Ray L. Bowers, November 4, 1970. Air Force Historical Research Agency, Maxwell AFB, AL.

Borling, John L. Interview by Dr. James C. Hasdorff, July 1, 1991. Air Force Historical Research Agency, Maxwell AFB, AL.

Borra, Anthony. Interview by Dr. Richard Burks Verrone, March 25, 2003. The Vietnam Archive, Texas Tech University.

Breckner, William J. Jr. Interview by Dr. James C. Hasdorff, May 7, 1992. Air Force Historical Research Agency, Maxwell AFB, AL.

Brett, Brig Gen Devol. Interview by Hugh N. Ahmann, June 16, 1981. Air Force Historical Research Agency, Maxwell AFB, AL.

Brown, Col Royal A. Interview by Lt Col V. H. Gallacher and Maj Lyn R. Officer, February 9, 1975. Air Force Historical Research Agency, Maxwell AFB, AL.

Brown, Gen George S. Interview by Maj Richard B. Clement and Capt Ralph G. Swenston, October 20, 1970. Air Force Historical Research Agency, Maxwell AFB, AL.

Brown, Maj Bruce. Interview by Capt Kenneth J. Alnwick, June 22, 1970. Air Force Historical Research Agency, Maxwell AFB, AL.

Brown, Maj Gen Donald D. Interview by Dr J. D. Hunley, February 20, 1987. Air Force Historical Research Agency, Maxwell AFB, AL.

Browning, Brig Gen Ralph T. Interview by Dr. James C. Hasdorff, September 25, 1991. Air Force Historical Research Agency, Maxwell AFB, AL.

Buhl, Capt Paul C. Interview by Lt Col I. R. Little, July 1968. Air Force Historical Research Agency, Maxwell AFB, AL.

Buhrow, Maj Robert E. Interview by Lt Col Robert Eckert and Maj Harry Shallcross, September 28, 1967. Air Force Historical Research Agency, Maxwell AFB, AL.

———. Interview by Grover Jarrett, April 11, 1968. Air Force Historical Research Agency, Maxwell AFB, AL.

Burke, Lt Gen Kelly H. Interview by Hugh N. Ahmann, April 23, 1991. Air Force Historical Research Agency, Maxwell AFB, AL.

Burke, W. M., G. F. Anderson, J. Lipsack, W. Posey, and H. Richardson. Interview by Dr. Robert Kritt, August 16, 1968. Air Force Historical Research Agency, Maxwell AFB, AL.

Burns, Lt Gen John J. Interview by Hugh N. Ahmann, January 5, 1984. Air Force Historical Research Agency, Maxwell AFB, AL.

Burns, Maj Gen John J. Interview by Dr. Jack Neufeld, March 22, 1973. Air Force Historical Research Agency, Maxwell AFB, AL.

Burrows, Maj Gen William C. Interview by Dr. James C. Hasdorff. Air Force Historical Research Agency, Maxwell AFB, AL.

Carpenter, Lt Gen John W. III. Interview by Lt Col Arthur W. McCants Jr. and Maj Scottie S. Thompson, January 12, 1979. Air Force Historical Research Agency, Maxwell AFB, AL.

Casey, Lt Gen Aloysius G. Interview by Hugh N. Ahmann, September 29, 1998. Air Force Historical Research Agency, Maxwell AFB, AL.

Catledge, Maj Gen Richard C. Interview by 1st Lt Wayne D. Perry, December 30, 1987. Air Force Historical Research Agency, Maxwell AFB, AL.

Cavanaugh, Col Michael E. Interview by Hugh N. Ahmann and D. Alexander, June 11, 1986. Air Force Historical Research Agency, Maxwell AFB, AL.

Cerak, John P. Interview by Dr James C. Hasdorff, June 11, 1991. Air Force Historical Research Agency, Maxwell AFB, AL.

Chaison, Maj Gen John R. Interview by Dr. Robert R. Kritt, August 12, 1971. Air Force Historical Research Agency, Maxwell AFB, AL.

Chambers, Clint. Interview by Kim Sawyer and Stephen Maxner, February 19, 2001. The Vietnam Archive, Texas Tech University.

Chapman, Calvin. Interview by Stephen Maxner, May 23, 2000. The Vietnam Archive, Texas Tech University.

Chesley, Paul Lew. Interview by Moryma Aydelott, May 28, 2005. Veterans History Project. Library of Congress.

Clark, Albert P. Interview by Dr. Jack Neufeld, May 2, 1973. Air Force Historical Research Agency, Maxwell AFB, AL.

Clark, Brig Gen Clifton C. Interview by Hugh N. Ahmann, November 1994. Air Force Historical Research Agency, Maxwell AFB, AL.

Clark, Capt Albert P. Interview by Maj Samuel E. Riddebarger, Maj Jeremy Thomas, Maj T.C. Peterson, and Maj K.C. Belt, June 12, 1969. Air Force Historical Research Agency, Maxwell AFB, AL.

Clark, Maj Bernard J. Interview by Col Ray L. Bowers, March 29, 1974. Air Force Historical Research Agency, Maxwell AFB, AL.

Clement, Capt Richard B. Interview by Herman Kolpak, December 4, 1968. Air Force Historical Research Agency, Maxwell AFB, AL.

Clum, Larry. Interview by Stephen Maxner, February 29, 2000. The Vietnam Archive, Texas Tech University.

Cobb, Lawrence II. Interview by Joyce Garner, May 27, 2005. Veterans History Project. Library of Congress.

Connelly, Robert N. Interview by Joyce Garner, May 27, 2005. Veterans History Project. Library of Congress.

Costin, Maj James. Interview by Maj Lyn R. Officer and Lt Col V. H. Gallagher, February 6, 1973. Air Force Historical Research Agency, Maxwell AFB, AL.

Creech, Gen Wilbur L. Interview by Hugh N. Ahmann, June 1992. Air Force Historical Research Agency, Maxwell AFB, AL.

Currey, John. Interview by Dr. Richard Burks Verrone, February 5, 2003. The Vietnam Archive, Texas Tech University.

Cushman, Lt Gen Robert E. Interview by Dr. Robert R. Kritt, August 13, 1971. Air Force Historical Research Agency, Maxwell AFB, AL.

Dahle, Maj Virgil L. Interview by Lt Col Robert Eckert and Maj Harry Shallcross, September 15, 1967. Air Force Historical Research Agency, Maxwell AFB, AL.

Davis, Donald. Interview by Dr. Richard Burks Verrone, March 6, 2003. The Vietnam Archive, Texas Tech University.

Davis, Gen Bennie L. Interview by Col Charles A. Coble and Lt Col Kenneth V. Funkhouser, March 10, 1984. Air Force Historical Research Agency, Maxwell AFB, AL.

Davis, Maj Henry M. Interview by Col Ray L. Bowers, April 24, 1972. Air Force Historical Research Agency, Maxwell AFB, AL.

Dawes, Charles Lamont. Interview by Talia Gibas, May 27, 2005. Veterans History Project. Library of Congress.

Deatrick, Col Eugene P., and Col Eleazer R. Parmly. Interview by Col Ray L. Bowers, May 9, 1972. Air Force Historical Research Agency, Maxwell AFB, AL.

Dethlefsen, Lt Col Merlyn H. Interview by Hugh N. Ahmann, December 20, 1971. Air Force Historical Research Agency, Maxwell AFB, AL.

Disosway, Gen Gabriel P. Interview by Lt Col John N. Dick, October 4, 1977. Air Force Historical Research Agency, Maxwell AFB, AL.

Dixon, Gen Robert J. Interview by Capt Mark C. Cleary, July 18, 1984. Air Force Historical Research Agency, Maxwell AFB, AL.

Dixon, Lt Gen Robert J. Interview by Col John J. Rosenow and Maj Richard B. Clement, December 1, 1970. Air Force Historical Research Agency, Maxwell AFB, AL.

Donnelly, Gen Charles L. Jr. Interview by Hugh N. Ahmann, October 15, 1990. Air Force Historical Research Agency, Maxwell AFB, AL.

Dorroh, Maj William E. Interview by Lt Col Valentino Castellina, April 10, 1968. Air Force Historical Research Agency, Maxwell AFB, AL.

Dresser, Col Ralph. Interview by Stephen Maxner, January 25, 2002. The Vietnam Archive, Texas Tech University.

Duckworth, Richard. Interview by Stephen Maxner, March 23, 2000. The Vietnam Archive, Texas Tech University.

Edelen, Col Henry H. Jr. Interview by Maj Samuel E. Riddebarger and Lt Col S. Bissell, January 27, 1970. Air Force Historical Research Agency, Maxwell AFB, AL.

Edmundson, Lt Gen James V. Interview by Capt Mark C. Cleary, July 29, 1983. Air Force Historical Research Agency, Maxwell AFB, AL.

Ellis, Maj Gen Billy J. Interview by Hugh N. Ahmann, February 1991. Air Force Historical Research Agency, Maxwell AFB, AL.

Emanuel, Maj Gen Herbert L. Interview by Col Harry C. McMillen, December 2, 1986. Air Force Historical Research Agency, Maxwell AFB, AL.

Emery, David Howard. Interview by Monty Alan Hostetler, February 8, 1990. The Vietnam Archive, Texas Tech University.

Erchinger, Ralph C. Interview by Dr. Richard Burks Verrone, February 8, 2006. The Vietnam Archive, Texas Tech University.

Evans, Gen William J. Interview by Dr. James C. Hasdorff, September 18, 1979. Air Force Historical Research Agency, Maxwell AFB, AL.

Evans, Lt Col Donald. Interview by Dr. Robert R. Kritt, December 9, 1968. Air Force Historical Research Agency, Maxwell AFB, AL.

Everest, Brig Gen Frank K. Jr. Interview by Hugh N. Ahmann, September 23, 1988. Air Force Historical Research Agency, Maxwell AFB, AL.

Everton, Myron. Interview by Richard Verrone, October 31, 2002. The Vietnam Archive, Texas Tech University.

Fairbrother, Brig Gen William H. Interview by Martin J. Miller and Joseph A. Ventola, Air Force Historical Research Agency, Maxwell AFB, AL.

Fer, Col John. Interview by Dr. James C. Hasdorff, June 4, 1991. Air Force Historical Research Agency, Maxwell AFB, AL.

Fesenmyer, CMSgt Denis. Interview by Hugh N. Ahmann, September 1988. Air Force Historical Research Agency, Maxwell AFB, AL.

Fischer, Robert. Interview by Dr. Richard Burks Verrone, March 20, 2003. The Vietnam Archive, Texas Tech University.

Fisher, Philip Richard. Interview by Sandra Mit-Chelle, May 28, 2005. Veterans History Project. Library of Congress.

Fleming, Capt Jerry. Interview by Maj Lyn R. Officer and Hugh N. Ahmann, February 21, 1973. Air Force Historical Research Agency, Maxwell AFB, AL.

Flynn, Lt Gen John P. Interview by Lt Col Arthur W. McCants Jr., February 28, 1980. Air Force Historical Research Agency, Maxwell AFB, AL.

Fortney, Col Alvin R. Interview by Lt John D. Considine, August 23, 1968. Air Force Historical Research Agency, Maxwell AFB, AL.

Foss, Maj Alfred W. Interview by Dr. Robert R. Kritt, August 16, 1968. Air Force Historical Research Agency, Maxwell AFB, AL.

Foss, Maj Alfred W., Capt Nash, and Maj Langford. Interview by Dr. Robert R. Kritt, August 16, 1968. Air Force Historical Research Agency, Maxwell AFB, AL.

Freeman, Capt Harold R. Interview by Maj Harry Shallcross, October 4, 1967. Air Force Historical Research Agency, Maxwell AFB, AL.

Furlong, Raymond. Interview by Hugh N. Ahmann, May 1980.

Gailer, Brig Gen Frank L. Interview by Lt Col John N. Dick Jr., Lt Col Gordon F. Nelson, and Maj Green. Air Force Historical Research Agency, Maxwell AFB, AL.

Gallagher, Col Michael R. Interview by John W. Leland, February 2, 1994. Air Force Historical Research Agency, Maxwell AFB, AL.

Galligan, Lt Gen Walter T. Interview by Maj Russell W. Mank and Capt Phillip S. Meilinger, April 4, 1979. Air Force Historical Research Agency, Maxwell AFB, AL.

———. Interview by Dr. James C. Hasdorff, December 12, 1983. Air Force Historical Research Agency, Maxwell AFB, AL.

Garrison, Col Vermont. Interview by F. D. Claypool, September 25, 1982. Air Force Historical Research Agency, Maxwell AFB, AL.

Gillem, Lt Gen Alvan. Interview by Lt Col Arthur W. McCants, February 13, 1979. Air Force Historical Research Agency, Maxwell AFB, AL.

Gillem, Lt Gen Alvan C. II. Interview by Dr. Robert R. Kritt, August 22, 1969. Air Force Historical Research Agency, Maxwell AFB, AL.

Gillis, Brig Gen Richard F. Interview by William P. Head, Diane H. Truluck, Cara N. Best, and TSgt Dave Chupinsky, February 20, 2002. Air Force Historical Research Agency, Maxwell AFB, AL.

Ginn, Lt Gen William H. Interview by Hugh N. Ahmann, June 1987. Air Force Historical Research Agency, Maxwell AFB, AL.

Ginsbergh, Maj Gen Robert N. Interview by Maj Richard B. Clement, June 3, 1971. Air Force Historical Research Agency, Maxwell AFB, AL.

Goddard, Maj Gen Richard N. Interview by William P. Head and Mary Ann Kan, January 10, 2000. Air Force Historical Research Agency, Maxwell AFB, AL.

Gorski., Maj Frank J. Jr. Interview by Lt Col V. H Gallacher and Maj Lyn R. Officer, February 5, 1973. Air Force Historical Research Agency, Maxwell AFB, AL.

Gray, Maj Gen David L. Interview by Maj Steven K. Yates, August 28, 1989. Air Force Historical Research Agency, Maxwell AFB, AL.

Greenhalgh, Lt Col William H. Interview by Lt Col Robert Eckert, October 11, 1967. Air Force Historical Research Agency, Maxwell AFB, AL.

Greenhalgh, Lt Col William H. Jr. Interview by Lt Col Robert Eckert, June 30, 1971. Air Force Historical Research Agency, Maxwell AFB, AL.

Griffin, Maj Richard L. Interview by Lt Col V. H. Gallacher and Hugh N. Ahmann, March 24, 1972. Air Force Historical Research Agency, Maxwell AFB, AL.

Griffith, Virginia. Interview by Stephen Maxner, September 29, 2001. The Vietnam Archive, Texas Tech University.

Gritten, Capt Phillip D., Sgt Alford, Capt Nichol, and Unidentified. Interview by Amn Mike Sheppard and SSgt Steve Sprague, April 1968. Air Force Historical Research Agency, Maxwell AFB, AL.

Gropman, Dr. Alan L. Interview by William F. Andrews, March 22, 2010.

Gropman, Maj Alan L. Interview by Col Ray L. Bowers, April 24, 1972. Air Force Historical Research Agency, Maxwell AFB, AL.

Guastella, Lt Col Joseph T. Interview by Bill B. Stacy, December 11, 1968. Air Force Historical Research Agency, Maxwell AFB, AL.

Gutches, Lt Col William H. Interview by Lt Col Barry L. Bonwit, June 5, 1968. Air Force Historical Research Agency, Maxwell AFB, AL.

Hadlock, Chaplain Capt C. E. Interview by Alden Haupt, June 5, 1968. Air Force Historical Research Agency, Maxwell AFB, AL.

Hagerstrom, Col James. Interview by John Sherwood, February 3, 1995. Air Force Historical Research Agency, Maxwell AFB, AL.

Hagerstrom, Col James P. Interview by Capt Porter, April 17, 1966. Air Force Historical Research Agency, Maxwell AFB, AL.

Hall, Col Robert E. Interview by Maj Lyn R. Officer and Hugh N. Ahmann, January 26, 1973. Air Force Historical Research Agency, Maxwell AFB, AL.

Hall, Lt Col George F. Interview by Lt Col Robert G. Zimmerman, July 15, 1975. Air Force Historical Research Agency, Maxwell AFB, AL.

Hamilton, Col Colin C., Jr. Interview by Dr. Robert R. Kritt, February 24, 1971. Air Force Historical Research Agency, Maxwell AFB, AL.

Hamilton, Richard. Interview by Dr. Richard Burks Verrone, April 10, 2003. The Vietnam Archive, Texas Tech University.

Hardin, Lt Gen Ernest C. Interview by Dr. James C. Hasdorff, April 17, 1985. Air Force Historical Research Agency, Maxwell AFB, AL.

Harp, David. Interview by Dr. Richard Burks Verrone, November 8, 2002. The Vietnam Archive, Texas Tech University.

Harris, Col Carlyle S. Interview by Capt Mark C. Cleary, November 16, 1982. Air Force Historical Research Agency, Maxwell AFB, AL.

Harris, Gen Hunter. Interview by Arthur Marmor, February 8, 1967. Air Force Historical Research Agency, Maxwell AFB, AL.

———. Interview by Col John E. VanDuyn and Major Richard B. Clement, July 7, 1971. Air Force Historical Research Agency, Maxwell AFB, AL.

———. Interview by Hugh N. Ahmann, March 14, 1974. Air Force Historical Research Agency, Maxwell AFB, AL.

Harris, Lt Gen Edgar S. Interview by Lt Col David L. Young, November 25, 1985. Air Force Historical Research Agency, Maxwell AFB, AL.

Harrison, Wilson. Interview by Richard Verrone, April 23, 2003. The Vietnam Archive, Texas Tech University.

Hartinger, Gen James V. Interview by Capt Barry J. Anderson, September 5, 1985. Air Force Historical Research Agency, Maxwell AFB, AL.

Hartman, Lt Col William B. Interview by Maj Lyn R. Officer and Lt Col V. H. Gallacher, December 11, 1972. Air Force Historical Research Agency, Maxwell AFB, AL.

Hendrickson, Capt James L. Interview by Maj Lyn R. Officer and Hugh N. Ahmann, January 31, 1973. Air Force Historical Research Agency, Maxwell AFB, AL.

Hildreth, Maj Gen James R. Interview by Dr. James C. Hasdorff, October 28, 1987. Air Force Historical Research Agency, Maxwell AFB, AL.

Hill, Col Howard J. Interview by Dr. James C. Hasdorff, July 12, 1991. Air Force Historical Research Agency, Maxwell AFB, AL.

Hoban, Lt Gen Richard M. Interview by Capt Mark C. Cleary, October 14, 1983. Air Force Historical Research Agency, Maxwell AFB, AL.

Hodgin, John. Interview by Dr. Richard Burks Verrone, February 3, 2003. The Vietnam Archive, Texas Tech University.

Hosley, Capt David L. Interview by Maj Harry Shallcross, September 27, 1967. Air Force Historical Research Agency, Maxwell AFB, AL.

Houston, Ronnie Lee. Interview by Laura Calkins, February 22, 2004. The Vietnam Archive, Texas Tech University.

Hubbs, Charles. Interview by Dr. Richard Burks Verrone, January 27, 2003. The Vietnam Archive, Texas Tech University.

Hudson, Col Robert M. Interview by Thomas C. Moncure, March 3, 2005. Veterans History Project. Library of Congress.

Huyser, Gen Robert E. Interview by Col George P. Cole and Lt Col Maurice Marynow, March 29, 1985. Air Force Historical Research Agency, Maxwell AFB, AL.

Ingelido, Maj Gen Michael J. Interview by Lt Col Roy Thomas, January 1985. Air Force Historical Research Agency, Maxwell AFB, AL.

Iosue, Brig Gen Andrew P. Interview by Col Ray L. Bowers, March 27, 1975. Air Force Historical Research Agency, Maxwell AFB, AL.

Jackson, Capt Charles A. Interview by Dr. James C. Hasdorff, June 6, 1991. Air Force Historical Research Agency, Maxwell AFB, AL.

Jackson, Col Joseph M. Interview by Hugh N. Ahmann, October 7, 1971. Air Force Historical Research Agency, Maxwell AFB, AL.

Jackson, Gary R. Interview by Dr. Richard Burks Verrone, December 6, 2002. The Vietnam Archive, Texas Tech University.

Janes, Lt Col Ray. Interview by Stephen Maxner, March 7, 2003. The Vietnam Archive, Texas Tech University.

Johnson, Brig Gen Kenneth R. Interview by Hugh N. Ahmann, September 18, 1988. Air Force Historical Research Agency, Maxwell AFB, AL.

Johnson, Congressman Sam. Interview by Stephen Maxner, March 12, 2001. The Vietnam Archive, Texas Tech University.

Johnson, Dana Logan. Interview by Talia Gibas, May 27, 2005. Veterans History Project. Library of Congress.

Johnson, Gen Hansford T. Interview by James K. Matthews and Jay H. Smith, July 15, 1992. Air Force Historical Research Agency, Maxwell AFB, AL.

Johnson, Gen Leon W., Gen Curtis E. LeMay, Gen David A. Burchinal, and Gen Jack J. Catton. Interview by Richard H. Kohn and Joseph P. Harahan, June 15, 1984. Air Force Historical Research Agency, Maxwell AFB, AL.

Johnson, Lt Col Kenneth R. Interview by Dr. James C. Hasdorff, July 26, 1991. Air Force Historical Research Agency, Maxwell AFB, AL.

Johnson, Lt Gen Gerald W. Interview by Charles K. Hopkins, October 2, 1972. Air Force Historical Research Agency, Maxwell AFB, AL.

———. Interview by Charles K. Hopkins, April 3, 1973. Air Force Historical Research Agency, Maxwell AFB, AL.

———. Interview by Dr. James C. Hasdorff, February 23, 1989. Air Force Historical Research Agency, Maxwell AFB, AL.

Jones, Brig Gen William C. Interview by Jonathan T. Schmidt, February 25, 2007. Adams Center, Virginia Military Institute.

Jones, John C. Interview by Sandra Mit-Chelle, May 28, 2005. Veterans History Project. Library of Congress.

Jones, Lt Gen David C. Interview by Maj Samuel E. Riddebarger, November 6, 1968. Air Force Historical Research Agency, Maxwell AFB, AL.

Kane, Lt Col Stuart E., and Capt Gary Sheets. Interview by Maj Ralph Rowley and Ben Goldman, May 17, 1970. Air Force Historical Research Agency, Maxwell AFB, AL.

Kari, Lt Col Paul A. Interview by Dr. James C. Hasdorff, April 5, 1992. Air Force Historical Research Agency, Maxwell AFB, AL.

Katz, Col Stephen. Interview by Dr. Richard Burks Verrone, January 14, 2003. The Vietnam Archive, Texas Tech University.

Katz, Stephen. Interview by Dr. Richard Burks Verrone, January 21, 2003. The Vietnam Archive, Texas Tech University.

Keeler, Lt Col Billie R. Interview by Maj Lyn R. Officer and Lt Col Vaughn H. Gallacher, February 5, 1973. Air Force Historical Research Agency, Maxwell AFB, AL.

Keith, Jack. Interview by Dr. Richard Burks Verrone, October 24, 2002. The Vietnam Archive, Texas Tech University.

Kimball, Lt Col Richard D. Interview by Ray L. Bowers, November 4, . Air Force Historical Research Agency, Maxwell AFB, AL.

King, Lt Col Loyd J. Interview by Lt Col Vaughn H. Gallacher and Maj Lyn R. Officer, February 8, 1973. Air Force Historical Research Agency, Maxwell AFB, AL.

Kirk, Maj William. Interview by unknown, 1968. Air Force Historical Research Agency, Maxwell AFB, AL.

Knapp, Lt Col Bruce. Interview by Cindi L. Noel, July 25, 1989. Air Force Historical Research Agency, Maxwell AFB, AL.

Knecht, SMSgt Gary. Interview by Hugh N. Ahmann and Col David Metz, January 29, 1988. Air Force Historical Research Agency, Maxwell AFB, AL.

Knight, Lt Gen James A. Interview by Dr. Edgar F. Puryear Jr., August 7, 1979. Air Force Historical Research Agency, Maxwell AFB, AL.

———. Interview by Col James C. Posgate, December 30, 1983. Air Force Historical Research Agency, Maxwell AFB, AL.

Koncz, Col Carlton J. Interview by Jerry N. Hines, December 13, 1968. Air Force Historical Research Agency, Maxwell AFB, AL.

Kosh, Ronald W. Interview by Gregory Kosh, February 25, 2007. Adams Center, Virginia Military Institute.

Kraljev, Lt Col Benjamin. Interview by Col Ray L. Bowers, January 29, 1971. Air Force Historical Research Agency, Maxwell AFB, AL.

Kruger, Kenneth. Interview by Dr. Richard Burks Verrone, February 25, 2003. The Vietnam Archive, Texas Tech University.

Kula, Col James D. Interview by Dr. James C. Hasdorff, August 30, 1991. Air Force Historical Research Agency, Maxwell AFB, AL.

Kurtz, Maj William M. Interview by Capt Kenneth J. Alnwick, June 25, 1970. Air Force Historical Research Agency, Maxwell AFB, AL.

Lappin, Pete. Interview by Stephen Maxner, September 1, 2000. The Vietnam Archive, Texas Tech University.

Lavelle, Gen John D. Interview by Lt Col John N. Dick, April 17, 1978. Air Force Historical Research Agency, Maxwell AFB, AL.

Lawrence, David Cobb, II. Interview by Joyce Garner, May 27, 2005. Veterans History Project. Library of Congress.

Lee, Capt Leonard C. Interview by Col Ray L. Bowers, April 28, 1972. Air Force Historical Research Agency, Maxwell AFB, AL.

Lippe, Charles. Interview by Stephen Maxner, September 22, 2001. The Vietnam Archive, Texas Tech University.

Lobdell, Maj Gen Harrison Jr. Interview by Hugh N. Ahmann, March 15, 1991. Air Force Historical Research Agency, Maxwell AFB, AL.

Lockley, Timothy C. Interview by Dr. Richard Burks Verrone, February 11, 2003. The Vietnam Archive, Texas Tech University.

Loh, Gen John M. Interview by Grant M. Hales and Jay B. Welsh, April 1994. Air Force Historical Research Agency, Maxwell AFB, AL.

Lowe, Maj Gen Dewey K. K. Interview by Maurice A. Miller, July 21, 1987. Air Force Historical Research Agency, Maxwell AFB, AL.

Lueker, Maj Rano E. Interview by Paul Skinner, June 30, 1971. Air Force Historical Research Agency, Maxwell AFB, AL.

Lurie, Brig Gen Alan P. Interview by Hugh N. Ahmann, September 21, 1988. Air Force Historical Research Agency, Maxwell AFB, AL.

Lynn, Maj Roy H. Interview by Lt Col Ray L. Bowers and Maj Victor Anthony, September 9, 1970. Historical Research Agency, Maxwell AFB, AL.

Madden, Lt Col Joseph B. Interview by Lt Col V. H. Gallacher and Maj Lyn R. Officer, February 7, 1973. Air Force Historical Research Agency, Maxwell AFB, AL.

Manor, Lt Gen Leroy. Interview by Hugh N. Ahmann, Lt Col David Mets, Julie Massoni,, and Donald D. Little, May 26, 1988. Air Force Historical Research Agency, Maxwell AFB, AL.

Marks, Richard. Interview by Stephen Maxner, August 27, 2002. The Vietnam Archive, Texas Tech University.

Marshall, Lt Col Marion A. Interview by Dr. James C. Hasdorff, August 13, 1991. Air Force Historical Research Agency, Maxwell AFB, AL.

Marshall, Maj Gen James H. Interview by Hugh N. Ahmann, June 29, 1994. Air Force Historical Research Agency, Maxwell AFB, AL.

Martin, Al. Interview by Stephen Maxner and Kim Sawyer, January 9, 2001. The Vietnam Archive, Texas Tech University.

McCall, TSgt John K. Interview by Hugh N. Ahmann, April 7, 1972. Air Force Historical Research Agency, Maxwell AFB, AL.

McCarthy, Col James R. Interview by Dr. Robert R. Kritt, April 11, 1975. Air Force Historical Research Agency, Maxwell AFB, AL.

McCollum, Terrance. Interview by Michael McCollum, no date . Veterans History Project. Library of Congress.

McLaughlin, Maj Gen Burl W. Interview by Col Louis P. Lindsay, April 20, 1970. Air Force Historical Research Agency, Maxwell AFB, AL.

McManus, Lt Col Kevin J. Interview by Dr. James C. Hasdorff, September 18, 1991. Air Force Historical Research Agency, Maxwell AFB, AL.

McMurtry, Jon. Interview by Stephen Maxner, September 1, 2000. The Vietnam Archive, Texas Tech University.

McNish, Thomas M. Interview by Dr. James C. Hasdorff, July 3, 1991. Air Force Historical Research Agency, Maxwell AFB, AL.

Mechenbier, Edward J. Interview by Dr. James C. Hasdorff, June 20, 1991. Air Force Historical Research Agency, Maxwell AFB, AL.

Merritt, Raymond. Interview by Dr. Richard Burks Verrone, September 15, 2003. The Vietnam Archive, Texas Tech University.

Meyer, Robert Louis. Interview by Sandra Mit-Chelle, May 28, 2005. Veterans History Project. Library of Congress.

Meyers, Maj Gen Gilbert L. Interview by Maj Richard B. Clement and Capt Ralph G. Swenston, May 27, 1970. Air Force Historical Research Agency, Maxwell AFB, AL.

Milligan, Capt Kenneth B. Interview by Lt Col Robert Eckert, October 4, 1967. Air Force Historical Research Agency, Maxwell AFB, AL.

Milton, Gen Theodore Ross. Interview by Capt Mark C. Cleary, July 9, 1982. Air Force Historical Research Agency, Maxwell AFB, AL.

Mize, Lt Col Robert L. Interview by Hugh N. Ahmann, September 21, 1971. Air Force Historical Research Agency, Maxwell AFB, AL.

Momyer, William W. Interview by Dr. Edgar F. Puryear Jr., September 9, 1981. Air Force Historical Research Agency, Maxwell AFB, AL.

Montemore, Martin. Interview by Dr. Richard Burks Verrone, March 27, 2003. The Vietnam Archive, Texas Tech University.

Moore, Col Winston E. Interview by SSgt James Smith, August 22, 1968. Air Force Historical Research Agency, Maxwell AFB, AL.

Moore, Gen William G. Interview by Lt Col Arthur W. McCants Jr., March 25, 1981. Air Force Historical Research Agency, Maxwell AFB, AL.

Moore, Lt Gen Joseph H. Interview by Maj Samuel E. Riddlebarger and Lt Col Valentino Castellina, November 22, 1969. Air Force Historical Research Agency, Maxwell AFB, AL.

———. Interview by Capt Mark C. Cleary, September 24, 1984. Air Force Historical Research Agency, Maxwell AFB, AL.

Moore, Maj Gen Thomas E. Interview by Hugh N. Ahmann, April 16, 1987. Air Force Historical Research Agency, Maxwell AFB, AL.

Morea, Michael. Interview by Stephen Maxner, January 25, 2001. The Vietnam Archive, Texas Tech University.

Morris, Col Thomas W. Interview by Capt Richard B. Clement, February 4, 1969. Air Force Historical Research Agency, Maxwell AFB, AL.

Moser, Richard. Interview by Dr. Richard Burks Verrone, February 24, 2006. The Vietnam Archive, Texas Tech University.

Mullins, Maj Gen James P. Interview by Hugh N. Ahmann, January 27, 1987. Air Force Historical Research Agency, Maxwell AFB, AL.

Nazzaro, Gen Joseph J. Interview by Maj Scott S. Thompson, February 3, 1980. Air Force Historical Research Agency, Maxwell AFB, AL.

Neel, Maj Charles. Interview by Jerry Cantrell, December 2, 1971. Air Force Historical Research Agency, Maxwell AFB, AL.

Negus, Col Kenneth D. Interview by Maj Lyn R. Officer and Hugh N. Ahmann, December 15, 1972. Air Force Historical Research Agency, Maxwell AFB, AL.

Nelson, John. Interview by Kim Sawyer, December 13, 2000. The Vietnam Archive, Texas Tech University.

Neuens, Col Martin J. Interview by Dr. James C. Hasdorff, September 26, 1991. Air Force Historical Research Agency, Maxwell AFB, AL.

Norris, Col William C. Interview by Lt Col Paul C. Weiland and Maj Richard B. Clement, February 1, 1971. Air Force Historical Research Agency, Maxwell AFB, AL.

Norris, Maj Gen William C. Interview by Hugh N. Ahmann, November 29, 1984. Air Force Historical Research Agency, Maxwell AFB, AL.

Novak, Maj Donald P. Interview by Maj Harry S. Fellerman, June 19, 1968. Air Force Historical Research Agency, Maxwell AFB, AL.

Officer, Maj Upton D. Interview by Lt Col Lyn R. Officer, July 11, 1973. Air Force Historical Research Agency, Maxwell AFB, AL.

Ohlinger, Lt Col John F. Interview by Capt Richard B. Clement, December 5, 1968. Air Force Historical Research Agency, Maxwell AFB, AL.

Ohlke, Brig Gen Harold W. Interview by Dr. Robert R. Kritt, April 26, 1971. Air Force Historical Research Agency, Maxwell AFB, AL.

Olds, Brig Gen Robin. Interview by Maj Geffen and Maj Folkman, est 1968. Air Force Historical Research Agency, Maxwell AFB, AL.

———. Interview by Lt Col John N. Dick, Jr. and Lt Col Gordon F. Nelson, February 17, 1977. Air Force Historical Research Agency, Maxwell AFB, AL.

———. Interview by Maj Russell W. Mank and Phillip, Capt. Meilinger, June 5, 1979. Air Force Historical Research Agency, Maxwell AFB, AL.

Olds, Col Robin. Interview by 2Lt Charles Heffron, July 12, 1967. Air Force Historical Research Agency, Maxwell AFB, AL.

Opitz, Stephen J., Lt Col. Interview by Lt Col Robert J. Zimmerman, July 18, 1975. Air Force Historical Research Agency, Maxwell AFB, AL.

Osur, Alan. Interview by Stephen Maxner, February 18, 2002. The Vietnam Archive, Texas Tech University.

Parker, John A. Interview by Stephen Maxner, July 20, 2000. The Vietnam Archive, Texas Tech University.

Parr, Col Ralph S. Interview by Frederick D. Claypool, December 1, 1989. Air Force Historical Research Agency, Maxwell AFB, AL.

Peckman, Maj Dale B. Interview by Lt Col Robert Eckert, September 18, 1967. Air Force Historical Research Agency, Maxwell AFB, AL.

Perna, Col Anthony J. Interview by Jacob C. Vishneski, March 13, 2008. Adams Center, Virginia Military Institute.

Pettijohn, Maj J. C., Col W. L. Stringer, and Col Colvini. Interview by Col Archie S. Mayes, January 1966. Air Force Historical Research Agency, Maxwell AFB, AL.

Pittman, Col Don D. Interview by Maj Samuel E. Riddlebarger. Air Force Historical Research Agency, Maxwell AFB, AL.

Pollard, Ben M., Col. Interview by Dr. James C. Hasdorff, May 11, 1992. Air Force Historical Research Agency, Maxwell AFB, AL.

Prather, Maj Gen Gerald L. Interview by Hugh N. Ahmann, June 6, 1991. Air Force Historical Research Agency, Maxwell AFB, AL.

Probst, Capt Lloyd J. Interview by Col Ray L. Bowers, May 8, 1972. Air Force Historical Research Agency, Maxwell AFB, AL.

Reich, William J., Lt. Col. Interview by Dr. James C. Hasdorff, July 30, 1991. Air Force Historical Research Agency, Maxwell AFB, AL.

Reynolds, Brig Gen Jon A. Interview by Dr. James C. Hasdorff, April 20, 1992. Air Force Historical Research Agency, Maxwell AFB, AL.

Ricks, Col William R. Interview by Anthony T. Bradley, November 11, 2005. Adams Center, Virginia Military Institute.

Riley, Col Charles A. Interview by Jesse B. Burnette, January 27, 2007. Adams Center, Virginia Military Institute.

Rilling, Lt Col Robert G. Interview by Gene Plunkett, August 25, 1968. Air Force Historical Research Agency, Maxwell AFB, AL.

Risner, Brig. Gen Robinson. Interview by Capt Mark C. Cleary, March 1, 1983. Air Force Historical Research Agency, Maxwell AFB, AL.

Ritchie, Capt Richard S. Interview by Hugh N. Ahmann, October 11, 1972. Air Force Historical Research Agency, Maxwell AFB, AL.

Robertson, Maj Gen Edwin W. Interview by Dr. James C. Hasdorff, April 24, 1989. Air Force Historical Research Agency, Maxwell AFB, AL.

Robinson, 1Lt Harold R. Interview by SSgt John R. Conner, December 4, 1968. Air Force Historical Research Agency, Maxwell AFB, AL.

Robinson, Col Paul K. Interview by Dr. James C. Hasdorff, August 10, 1991. Air Force Historical Research Agency, Maxwell AFB, AL.

Rushworth, Maj Gen Robert A. Interview by Dr. James C. Hasdorff, April 14, 1987. Air Force Historical Research Agency, Maxwell AFB, AL.

Russell, Glenn. Interview by Joyce Garner, May 27, 2005. Veterans History Project. Library of Congress.

Ryan, Gen John D. Interview by Maj Richard B. Clement, May 20, 1971. Air Force Historical Research Agency, Maxwell AFB, AL.

Ryan, Maj Gen Malcolm E. Interview by Col Charles R. Edwards, December 6, 1984. Air Force Historical Research Agency, Maxwell AFB, AL.

Sadler, Maj Gen Thomas M. Interview by Lt Col Richard C. McCoy, December 3, 1987. Air Force Historical Research Agency, Maxwell AFB, AL.

Saunders, Bill. Interview by Robert McGraw, March 3, 2005. Adams Center, Virginia Military Institute.

See, Lt Col Dennis R. Interview by Col Ray L. Bowers, March 29, 1974. Air Force Historical Research Agency, Maxwell AFB, AL.

Shirley, SMSgt Vaughn. Interview by Lt Col Judd Katz, February 6, 1992. Air Force Historical Research Agency, Maxwell AFB, AL.

———. Interview by Lt Col Judd Katz, February 6, 1992. Air Force Historical Research Agency, Maxwell AFB, AL.

Singleton, Jerry A., Lt. Col. Interview by Dr. James C. Hasdorff, October 30, 1992. Air Force Historical Research Agency, Maxwell AFB, AL.

Sipple, Capt Garry C. Interview by Lt Col Robert Eckert, April 1968. Air Force Historical Research Agency, Maxwell AFB, AL.

Smith, Maj Howell W. Interview by Lt Col Robert Eckert and Maj Harry Shallcross, August 1967. Air Force Historical Research Agency, Maxwell AFB, AL.

Smith, Wayne O. Interview by Dr. James C. Hasdorff, October 2, 1992. Air Force Historical Research Agency, Maxwell AFB, AL.

Spoon, Capt Donald R. Interview by Unidentified, April 1973. Air Force Historical Research Agency, Maxwell AFB, AL.

Stone, Frank III. Interview by Kim Sawyer, March 21, 2001. The Vietnam Archive, Texas Tech University.

Stoner, Col John R. Interview by Maj Ralph A. Rowley, May 18, 1970. Air Force Historical Research Agency, Maxwell AFB, AL.

———. Interview by Col Ray L. Bowers, August 15, 1972. Air Force Historical Research Agency, Maxwell AFB, AL.

Stovall, Capt Dale E. Interview by Unknown, 1975. Air Force Historical Research Agency, Maxwell AFB, AL.

Stutz, Leroy W.,Col. Interview by Dr. James C. Hasdorff, July 31, 1991. Air Force Historical Research Agency, Maxwell AFB, AL.

Sullivan, Dennis. Interview by Dr. Richard Burks Verrone, January 30, 2003. The Vietnam Archive, Texas Tech University.

Suter, Lt Col Richard. Interview by Lt Col Gordon F. Nelson and Lt Col John N. Dick, January 26, 1977. Air Force Historical Research Agency, Maxwell AFB, AL.

Sweat, Lt Gen Dale S. Interview by Capt Mark C. Cleary, February 15, 1984. Air Force Historical Research Agency, Maxwell AFB, AL.

Sweet, John. Interview by Stephen Maxner, August 7, 2003. The Vietnam Archive, Texas Tech University.

Talbott, Lt Gen Carlos M. Interview by Hugh N. Ahmann, June 10, 1985. Air Force Historical Research Agency, Maxwell AFB, AL.

Thatcher, George. Interview by Jonathan Bernstein, November 15, 2001. The Vietnam Archive, Texas Tech University.

Tilton, William. Interview by Stephen Maxner, August 24, 2000. The Vietnam Archive, Texas Tech University.

Timmer, Don. Interview by Dr. Richard Burks Verrone, January 6, 2003. The Vietnam Archive, Texas Tech University.

Tixier, Edward L., Lt Gen. Interview by Hugh N. Ahmann, June 1993. Air Force Historical Research Agency, Maxwell AFB, AL.

Tolman, Maj Frederick G. Interview by Unidentified, 1967. Air Force Historical Research Agency, Maxwell AFB, AL.

Treadwell, James R. Interview by Matthew, Cadet Treadwell, February 19, 2007. Adams Center, Virginia Military Institute.

Triantafellu, Maj Gen Rocky. Interview by Dr. Robert R. Kritt, May 3, 1971. Air Force Historical Research Agency, Maxwell AFB, AL.

Trott, Allen. Interview by Dr. Richard Burks Verrone, March 4, 2003. The Vietnam Archive, Texas Tech University.

Trunbo, Lt Col Charles E. Interview by Joseph H. Grainger, July 13, 1968. Historical Research Agency, Maxwell AFB, AL.

Turk, Robert. Interview by Dr. Richard Burks Verrone, February 10, 2003. The Vietnam Archive, Texas Tech University.

Turley, Hansel Jr. Interview by Vera Clyburn, May 28, 2005. Veterans History Project. Library of Congress.

Two USAF ABCCC Controllers. Interview by Maj F. Felciano, December 31, 1969. Air Force Historical Research Agency, Maxwell AFB, AL.

Tyler, Brig Gen Morgan S. Interview by Sgt Michael Pfau, September 10, 1968. Air Force Historical Research Agency, Maxwell AFB, AL.

Umstead, Stanley M., Lt Gen. Interview by Capt Mark C. Cleary, July 22, 1983. Air Force Historical Research Agency, Maxwell AFB, AL.

Van Gilder, Lt Col William S. Interview by 1Lt G. Harrison, June 20, 1968. Air Force Historical Research Agency, Maxwell AFB, AL.

Vandenberg, Hoyt S. Interview by Dr. Edgar F. Puryear Jr., August 12, 1976. Air Force Historical Research Agency, Maxwell AFB, AL.

Vandenberg, Maj Gen Hoyt S. Interview by Lt Col James D. Weidamam, December 19, 1985. Air Force Historical Research Agency, Maxwell AFB, AL.

Vogt, John W, Gen. Interview by Claude G. Morita, November 29, 1973. Air Force Historical Research Agency, Maxwell AFB, AL.

———. Interview by Dr. Edgar F. Puryear Jr., September 9, 1981. Air Force Historical Research Agency, Maxwell AFB, AL.

Wade, Gen Horace M. Interview by Hugh N. Ahmann, October 10, 1978. Historical Research Agency, Maxwell AFB, AL.

Wallace, Lt Col James L. Interview by Col Ray L. Bowers, April 3, 1972. Air Force Historical Research Agency, Maxwell AFB, AL.

Walter, Col Alonzo J. Interview by Capt Richard B. Clement, July 28, 1970. Air Force Historical Research Agency, Maxwell AFB, AL.

Webb, Lt Col William, Lt Col Robert Ericson, and Maj Ronald Lanman. Interview by Col Ray L. Bowers, February 14, 1974. Air Force Historical Research Agency, Maxwell AFB, AL.

Wells, Lt Gen Selmon W. Interview by Dr. Robert R. Kritt, May 3, 1971. Air Force Historical Research Agency, Maxwell AFB, AL.

Westenbarger, Capt David P. Interview by Lt Col Robert Eckert and Maj Harry Shallcross, November 17, 1967. Air Force Historical Research Agency, Maxwell AFB, AL.

Weyant, Col J. A. Interview by Jerry N. Hinds, January 19, 1968. Air Force Historical Research Agency, Maxwell AFB, AL.

Williams, Maj Thomas O. Interview by Robert Smith, December 1, 1971. Air Force Historical Research Agency, Maxwell AFB, AL.

Wilson, Gen Louis L. Interview by Lt Colonel Gordon F. Nelson, March 2, 1977. Air Force Historical Research Agency, Maxwell AFB, AL.

Wilson, Gen Louis L. Interview by Lt Col Arthur W. McCants Jr., November 7, 1979. Air Force Historical Research Agency, Maxwell AFB, AL.

Wilson, Lt Gen James W. Interview by Hugh N. Ahmann, March 26, 1984. Historical Research Agency, Maxwell AFB, AL.

Wilson, Lt Gen Joseph G. Interview by Dr. Edgar F. Puryear Jr., August 5, 1981. Air Force Historical Research Agency, Maxwell AFB, AL.

Wilson, Maj Gen Winston P. Interview by Charles J. Gross, December 17, 1978. Air Force Historical Research Agency, Maxwell AFB, AL.

Winn, Brig Gen David W. Interview by Capt Mark C. Cleary, February 9, 1983. Air Force Historical Research Agency, Maxwell AFB, AL.

Wooten, Colonel E. Interview by Lt Col John Schlight, March 27, 1970. Air Force Historical Research Agency, Maxwell AFB, AL.

Yeager, Brig Gen Charles E. Interview by Maj Scott S. Thompson, May 1, 1980. Air Force Historical Research Agency, Maxwell AFB, AL.

Young, Maj Gen James A. Interview by Dr. James C. Hasdorff, September 24, 1985. Air Force Historical Research Agency, Maxwell AFB, AL.

Memoirs

Adams, Chris. *Inside the Cold War: A Cold Warrior's Reflections*. Maxwell Air Force Base, AL: Air University Press, 1999.

Anderson, Clarence E. *To Fly and Fight: Memoirs of a Triple Ace*. Pacifica, CA: Pacifica Military History, 1999.

Bach, Richard. *Stranger to the Ground*. New York: Harper & Row, 1963.

Barry, Bill. *A Trash Hauler in Vietnam: Memoir of Four Tactical Airlift Tours, 1965-1968*. Jefferson, NC: McFarland, 2008.

Basel, G. I. *Pak Six: A True Story*. Kearney, NE: Morris Publishing, 1982.

Bell, Ken. *100 Missions North: A Fighter Pilot's Story of the Vietnam War*. Washington, DC: Brassey's, 1993.

Bellarts, Larry J. *Red-Tailed Peacemaker*. Portland, OR: Binford & Mort Pub, 2001.

Blesse, F. C. *Check Six: A Fighter Pilot Looks Back*. Mesa, AZ: Champlin Fighter Museum Press, 1987.

Bottomly, Heath. *Prodigal Father: A Fighter Pilot Finds Peace in the Wake of His Destruction*. Glendale, CA: G/L Regal Books, 1975.

Broughton, Jack. *Going Downtown: The War Against Hanoi and Washington*. New York: Orion Books, 1988.

———. *Rupert Red Two: A Fighter Pilot's Life from Thunderbolts to Thunderchiefs*. St. Paul, MN: Zenith, 2007.

———. *Thud Ridge*. Philadelphia: Lippincott, 1969.

Certain, Robert G. *Unchained Eagle: From Prisoner of War to Prisoner of Christ*. Palm Springs, CA: ETC Publications, 2003.

Chesley, Larry. *Seven Years in Hanoi; a POW Tells His Story*. Salt Lake City: Bookcraft Inc, 1973.

Clancy, Tom, and Chuck Horner. *Every Man a Tiger*. New York: Putnam, 1999.

Cobleigh, Ed. *War For the Hell of It: A Fighter Pilot's View of Vietnam*. New York: Berkley Caliber, 2005.

Cook, Jerry W. *Once A Fighter Pilot*. McGraw-Hill Professional, 2002.

Cooper, Garry Gordon. *Sock It to 'em Baby: Forward Air Controller in Vietnam*. Crows Nest, N.S.W: Allen & Unwin, 2006.

Creech, William T. *The 3rd Greatest Fighter Pilot*. Bloomington, IN: AuthorHouse, 2005.

Day, George E. *Return with Honor*. Mesa, AZ: Champlin Museum Press, 1990.

Dramesi, John A. *Code of Honor*. New York: Norton, 1975.

Druen, Dan. *Sometimes We Flew Too: (a Fighter Pilot's Last Chapter)*. Lynchburg, Va: Warwick House Pub, 1998.

Drury, Richard S. *My Secret War*. Fallbrook, CA: Aero Publishers, 1979.

Edgerton, Clyde. *Solo: My Adventures in the Air*. Chapel Hill, NC: Algonquin Books of Chapel Hill, 2005.

Elliott, Duong Van Mai. *The Sacred Willow: Four Generations in the Life of a Vietnamese Family*. New York: Oxford University Press, 1999.

Fields, Kenny Wayne. *The Rescue of Streetcar 304: A Navy Pilot's Forty Hours on the Run in Laos*. Annapolis, MD: Naval Institute Press, 2007.

Fisher, Bernard. *Beyond the Call of Duty: The Story of an American Hero in Vietnam*. Salt Lake City, UT: Shadow Mountain, 2004.

Flanagan, John F. *Vietnam Above the Treetops: A Forward Air Controller Reports*. New York: Praeger, 1992.

Foster, Cecil. *MiG Alley to Mu Ghia Pass: Memoirs of a Korean War Ace*. Jefferson, NC: McFarland, 2001.

Graham, Roger D. *The Nimrods: A-26 Nimrods and the Secret War in Laos--Timeless American Courage in Combat, Lessons Learned for the Wars in Iraq and Afghanistan, and the War on Terror*. Bloomington, IN: AuthorHouse, 2007.

Guarino, Larry. *A POW's Story: 2801 Days in Hanoi*. New York: Ivy Books, 1990.

Halliday, John T. *Flying Through Midnight: A Pilot's Dramatic Story of His Secret Missions Over Laos During the Vietnam War*. New York: Scribner, 2005.

Harder, Robert O. *Flying from the Black Hole: The B-52 Bombardiers of Vietnam*. Annapolis, MD: Naval Institute Press, 2009.

Harrison, Marshall. *A Lonely Kind of War: Forward Air Controller, Vietnam*. Novato, CA: Presidio Press, 1989.

Harten, Don. *Arc Light One*. Limited ed. Paducah, KY: Turner Pub, 2003.

Hathorn, Reginald. *Here There Are Tigers: The Secret Air War in Laos, 1968-69*. Mechanicsburg, PA: Stackpole Books, 2008.

Hayes, Jack W. *Cavalry Trooper to Fighter Pilot-- and Three Wars*. Manhattan, KS: Sunflower University Press, 1997.

Hooppaw, James. *Where the Buf Fellows Roamed*. Gig Harbor, WA: Red Apple Publishing, 1999.

Hukee, Byron. "A-1 Skyraider Combat Journal." http://skyraider.org/hook/index.htm.

Hunter, Dean. *For Love of Life and Country*. New York: Vantage Press, 2003.

Jackson, Mike. *Naked in Da Nang: A Forward Air Controller in Vietnam*. St. Paul, MN: Zenith Press, 2004.

Jensen, Jay R. *Six Years in Hell: A Returned POW Views Captivity, Country, and the Nation's Future*. Bountiful, UT: Horizon Publishers, 1974.

Johnson, Howard C., and Ian A. O'Connor. *Scrappy: Memoir of a U.S. Fighter Pilot in Korea and Vietnam*. Jefferson, NC: McFarland, 2007.

Johnson, Sam. *Captive Warriors: A Vietnam POW's Story*. College Station: Texas A & M University Press, 1992.

Johnson, Val Ross. *Night Owl Fighter Pilot*. Lincoln, NE: iUniverse, Inc., 2006.

Kan, Bob. *(I Am) A Real American: Memoirs of a 3rd Generation Japanese-American USAF Fighter Pilot*. Bloomington, IN: AuthorHouse, 2008.

Lenski, Al. *Magic 100: The Story of an F-105, 100 Combat Mission Tour, NVN '67*. Paducah, KY: Turner Pub, 1995.

Marrett, George J. *Cheating Death: Combat Air Rescues in Vietnam and Laos*. Washington, D.C: Smithsonian Books, 2003.

McCarthy, Mike. *Phantom Reflections: The Education of an American Fighter Pilot in Vietnam*. Westport, CT: Praeger Security International, 2007.

McLester, Jud. *Thru a Pilot's Eye: Cold War Through Vietnam Era*. Bloomington, IN: 1st Books, 2004.

Metz, Robert E. *The Story of-- KING: That Others May Live*. Bloomington, IN: AuthorHouse, 2006.

Nasmyth, Spike. *2355 Days: A POW's Story*. New York: Orion Books, 1991.

Nyc, Frederick F. *Blind Bat: C-130 Night Forward Air Controller Ho Chi Minh Trail*. Austin, TX: Eakin Press, 2000.

Olds, Robin, Christina Olds, and Ed Rasimus. *Fighter Pilot: The Memoirs of Legendary Ace Robin Olds*. St. Martin's Press, 2010.

Rasimus, Ed. *Palace Cobra: A Fighter Pilot in the Vietnam Air War*. New York: St. Martin's Press, 2006.

———. *When Thunder Rolled: An F-105 Pilot Over North Vietnam*. Washington, D.C: Smithsonian Books, 2003.

Richardson, Dave. *Vietnam Air Rescues*. Seattle, WA: CreateSpace, 2008.

Risner, Robinson. *The Passing of the Night: My Seven Years as a Prisoner of the North Vietnamese*. New York: Random House, 1974.

Ross, Bob. *The Warriors: Reflections of a Fighter Pilot, Test Pilot, and Veteran of the Air Wars Over Vietnam*. Las Cruces, NM: Yucca Tree Press, 2002.

Smith, Robert W. "Robert W. Smith Autobiography." *NF104: Birth of a Spaceplane*. http://www.nf104.com/ab/index.html.

Thorsness, Leo. *Surviving Hell: A POW's Journey*. New York: Encounter Books, 2008.

Tra□m, Dang Thuy. *Last Night I Dreamed of Peace: The Diary of Dang Thuy Tram*. New York: Harmony Books, 2007.

Truong Nhu Tang. *A Vietcong Memoir*. San Diego: Harcourt Brace Jovanovich, 1985.

Vaughan, David Kirk. *Runway Visions: An American C-130 Pilot's Memoir of Combat Airlift Operations in Southeast Asia, 1967-1968*. Jefferson, NC: McFarland, 1998.

Welch, John F. *My Year in Viet Nam*. Rapid City, SD: Silver Wings Aviation, 2005.

Wells, George Cline. *It's That Way Everywhere, George*. Bloomington, IN: AuthorHouse, 2007.

Westmoreland, William C. *A Soldier Reports*. Garden City, NY: Doubleday, 1976.

Wood, Richard. *Call Sign Rustic: The Secret Air War Over Cambodia, 1970-1973*. Washington, DC: Smithsonian Institution Press, 2002.

Yarborough, Tom. *Da Nang Diary: A Forward Air Controller's Year of Combat Over Vietnam*. New York: St. Martin's Press, 1990.

Yeager, Chuck. *Yeager, an Autobiography*. Toronto: Bantam Books, 1985.

Reporting and Anthologies

"2 MORE U.S. PLANES DOWNED IN NORTH; TOTAL NOW IS 225." *New York Times*. Saigon, May 2, 1966.

"4 U.S. Women in Hanoi Said to See Bombed Sites." *New York Times*, December 26, 1966.

"559 Pilots Boast Most Experienced Flight." *The Sandscript*, August 18, 1967. http://www.12tfw.org/articl6.htm.

559TFS Pilots. *Sharkbait 21*. Tape. Cam Ranh Bay Air Base, 1967. http://12tfw.org/sharbait.htm.

"A FLIER DISPUTES REPORT ON RAIDS." *New York Times*, December 29, 1966.

Abrams, Gen Creighton. "Speech to B-52 Crews U-Tapao AB," January 28, 1969. Air Force Historical Research Agency, Maxwell AFB, AL.

AIlen, MSgt K. A. "Karl Richter - He Believed." *The Airman Magazine*, November 1967.

Air Combat Command Public Affairs Office. "Fact Sheets: Joint Direct Attack Munition GBU-31/32/38." http://www.af.mil/information/factsheets/factsheet.asp?id=108.

Air Force Enlisted Heritage Research Institute. "Enlisted Recipients of the Air Force Cross." http://afehri.maxwell.af.mil/Pages/AFCross/AFCross.htm.

Air Force Historical Studies Office. "Air Force Medal of Honor Recipients." http://www.airforcehistory.hq.af.mil/PopTopics/MOH.htm.

"Air Force Limiting Pilots' North Vietnam Missions." *New York Times*, April 12, 1966.

"Air Force Magazine's Guide to Aces and Heroes." *Air Force Magazine*, May 2009.

"Aircraft: Fairchild C-123B Provider." http://www.aero-web.org/specs/fairchil/c-123b.htm.

"American Jets Bombed Village In South Vietnam, U.S. Reports." *New York Times (1857-Current file)*, March 6, 1967.

"AN ACCUSED PILOT BEING SENT TO U.S.." *New York Times*, July 17, 1973.

"ANGER OVER DIKES IS FOUND IN NORTH." *New York Times*, January 21, 1967.

Anthis, Maj Gen Hollen H. "FAC/ALO Conference Remarks," 1963. Air Force Historical Research Agency, Maxwell AFB, AL.

Apple, R. W. "Witness, Telling of Hanoi Raid, Reports Few Civilians Killed." *New York Times*, July 14, 1966.

Apple, R.W. "Spotter-Plane Pilots Hunt Foe North of Vietnam's Buffer Zone." *New York Times*, August 12, 1966.

"Armed Forces: The Fighting American." *Time*, April 23, 1965.

"Armed Forces: The Pilot Pinch." *Time*, April 14, 1967.

Armstrong, Lt Gen Spence "Sam", and Lt Gen Michael Nelson. "Dodging Missiles." *Airspacemag.com*. http://www.airspacemag.com/multimedia/40351592.html.

Baldwin, Hanson W. "Air Power in Vietnam." *New York Times*, July 3, 1965.

———. "Targets in the North." *New York Times*, September 21, 1967.

———. "U.S. Plane Losses at 1,750 In 5 Years of Vietnam War." *New York Times*, February 6, 1967.

"Battle Jump: New Tactics Step Up the War." *Life*, March 10, 1967.

Beechers, William. "U. S. TO STEP UP BOMBING IN LAOS." *New York Times*, November 2, 1968.

Belair, Felix. "M'NAMARA SEES HARDER FIGHTING IN VIETNAM SOON." *New York Times*, April 21, 1966.

Bigelow, MSgt Larry W. *End of Tour Report*, April 1969. Air Force Historical Research Agency, Maxwell AFB, AL.

"Biographies: Lieutenant General Lawrence E. Boese." http://www.af.mil/information/bios/bio.asp?bioID=4722.

"Biographies: Major General Allison C. Brooks." http://www.af.mil/information/bios/bio.asp?bioID=4800.

"Biographies: Major General William S. Chairsell." http://www.af.mil/bios/bio.asp?bioID=4966.

"Biographies: Brigadier General Thomas J. Du Bose." http://www.af.mil/information/bios/bio.asp?bioID=5280.

"Biographies: Brigadier General Frank Kendall Everest Jr.." http://www.af.mil/information/bios/bio.asp?bioID=5378.

"Biographies: Major General John C. Giraudo." http://www.af.mil/bios/bio.asp?bioID=5551.

"Biographies : Major General William H. Holt." http://www.af.mil/bios/bio.asp?bioID=5841.

"Biographies : Major General Larry M. Killpack." http://www.af.mil/bios/bio.asp?bioID=6058.

"Biographies: Lieutenant General James E. Light Jr.." http://www.af.mil/information/bios/bio.asp?bioID=6199.

"Biographies : Brigadier General Carl S. Miller." http://www.af.mil/bios/bio.asp?bioID=6466.

"Biographies : Major General Edward A. Mcgough III." http://www.af.mil/bios/bio.asp?bioID=6399.

"Biographies: Major General John Daniel Lavelle." http://www.af.mil/information/bios/bio.asp?bioID=6157.

"Biographies: Major General William C. Norris." http://www.af.mil/information/bios/bio.asp?bioID=6615.

"Biographies: Brigadier General Robin Olds." http://www.af.mil/information/bios/bio.asp?bioID=6651. "Biographies : Major General James A. Young." http://www.af.mil/bios/bio.asp?bioID=7686.

"Biography Maj. Gen. Cuthbert A. 'Buck' Pattillo." http://www.highironillustrations.com/rogues/buck_patillo.html.

"Biographies: Lieutenant General Selmon W. Wells." http://www.af.mil/information/bios/bio.asp?bioID=7547.

"Biographies: Brigadier General Adriel N. Williams." http://www.af.mil/information/bios/bio.asp?bioID=7591.

"Biographies: Lieutenant General Joseph G. Wilson." http://www.af.mil/bios/bio.asp?bioID=7615.

"Biographies: Brigadier General David W. Winn." http://www.af.mil/information/bios/bio.asp?bioID=7625.

"Boeing: News Feature - F-4 Phantoms Phabulous 40th." http://www.boeing.com/defense-space/military/f4/.

"Bombing South Vietnam." *New York Times*, August 27, 1966.

"Boxer 22 SAR." *Air Rescue*. http://www.pjsinnam.com/VN_History/Boxer22/Boxer_22.htm.

Britton, Col Warner A. *End of Tour Report*, March 2, 1972. Air Force Historical Research Agency, Maxwell AFB, AL.

Brooks, Brig Gen Allison C. "Aerospace Rescue and Recovery—Southeast Asia to Apollo." *Air University Review* (June 1967).

Brown, Lt Col Cortez C. *End of Tour Report*, July 1, 1971. Air Force Historical Research Agency, Maxwell AFB, AL.

Brown, Lt Col Marion D. R. *End of Tour Report*, December 10, 1969. Air Force Historical Research Agency, Maxwell AFB, AL.

Brown, Lt Col Royal A. *End of Tour Report*, June 28, 1971. Air Force Historical Research Agency, Maxwell AFB, AL.

Brumfield, Maj Tom W. *End of Tour Report*. Air Force Historical Research Agency, Maxwell AFB, AL.

Brush, Peter. "Lifeline to Khe Sanh: The 109th Quartermaster Company (air Delivery)," 1996. http://chss.montclair.edu/english/furr/Vietnam/pb109.html.

Buckley, Tom. "U.S. Plane Losses in Vietnam Pass 1,000 as 5 Are Downed." *New York Times*. Saigon, January 6, 1968.

Bunker, Lt Col Robert A. *End of Tour Report*, December 8, 1969. Air Force Historical Research Agency, Maxwell AFB, AL.

Bunton, Maj Robert A. *End of Tour Report*, December 9, 1969. Air Force Historical Research Agency, Maxwell AFB, AL.

"CAMBODIA: Desperate Days for Besieged Phnom-Penh." *Time*, August 20, 1973.

"CAMBODIA: The U.S. Turns to the Prince." *Time*, July 16, 1973.

"Canada Students Protest Bombing." *The Washington Post, Times Herald*, February 10, 1965.

Chain, John T. *End of Tour Report*. Air Force Historical Research Agency, Maxwell AFB, AL.

Chinnery, Philip D. *Life on the Line: Stories of Vietnam Air Combat*. New York: St. Martin's Press, 1988.

Clark, Evert. "Barrier's Devices Could Detect Foe." *New York Times*, September 8, 1967.

"Clearing Skies Bring U.S. Planes Over the Capital of North Vietnam." *New York Times*, January 8, 1967.

Cruickshank, Capt John P. *End of Tour Report*, December 11, 1969. Air Force Historical Research Agency, Maxwell AFB, AL.

Davis, Peter. *Hearts and Minds*. Criterion Collection (re-released 2002). Criterion, 1975.

"Defense Sites in North Hit." *New York Times*, December 29, 1966.

"Dubois - Trail FAC - Tet 1968 at Hue." http://www.cc.gatech.edu/fac/Thomas.Pilsch/AirOps/Dubois.html.

Dubois, Bob. "The Tet Offensive at Hué: Trail FACs at the MACV Compound: Captain Bob Dubois." *Air Operations: Vietnam*. http://www.cc.gatech.edu/fac/Thomas.Pilsch/AirOps/Dubois.html.

Eubank, Taylor. *Alone, Unarmed, and Unafraid: Tales of Reconnaissance in Vietnam*. Jefferson, NC: McFarland, 1991.

Evans, D. L., Colonel. *Personal Observations on the War in SEA: 1 August 1971 to 1 June 1972*. End of Tour Report. Air Force Historical Research Agency, Maxwell AFB, AL.

Everett, Capt Robert P. "Vietnam Airlift is a Human Thing." *Airman Magazine*, October 1968.

Fackrell, MSgt Howard S. "The AC-119K Gunship Program Vietnam--My Second Tour." The Vietnam Archive, Texas Tech University.

"Fairchild C-123 Provider - transport aircraft." http://www.aviastar.org/air/usa/fair_provider.php.

Fall, Bernard B. "Report on North Vietnam The Other Side Of the 17th Parallel." *New York Times*, July 10, 1966.

FerrariLevine, Grace. “Fair Play: CBS, General Westmoreland and How a Television Documentary Went Wrong.” *Journalism Quarterly* 66, no. 2 (Summer 1989): 499.

Finney, John W. “27 Heavy Bombers from Guam Hit Vietcong Force in South Vietnam; Wilson Will Lead Peace Mission.” *New York Times*, June 18, 1965.

“Fire Support Coordination: Tactical Air Support - Part 1.” http://web.archive.org/web/20061030005647/www.gruntonline.com/US_Forces/US_Artillery/arty13.htm.

Flak, Dan. “Flak’s Fighter Fling.” http://www.danflak.com/military/war_story/warst12.html.

Flynn, Brig Gen John P. “Presentation to Air Command and Staff College,” June 24, 1974.

Foster, SSgt Albert W. *End of Tour Report*, January 1969. Air Force Historical Research Agency, Maxwell AFB, AL.

Frankel, Max. “U.S. Aides Split on Raid’s Effect.” *New York Times*, June 19, 1965.

Frazier, Lester G. “Holiday in Southeast Asia.” http://www.lesfrazier.com/holi.htm.

———. “Trash Hauler Mountain.” http://lesfrazier.com/trash.htm.

Gabrueluk, SSgt Frank. “Frustrated 557 TFS Pilot Finds Bogie’s Not a MiG.” *The Sandscript*, December 7, 1966, Vol. 1 No. 42 edition.

Gaizauskas, Maj Bruce C. *End of Tour Report*, December 10, 1969. Air Force Historical Research Agency, Maxwell AFB, AL.

“Generals Out of Control.” *New York Times*, September 1, 1967.

George, SMSgt James A. “Just Call Him PJ.” *The Airman Magazine*, July 1968.

Gerblick, Maj Paul. *End of Tour Report*, December 10, 1969. Air Force Historical Research Agency, Maxwell AFB, AL.

Gilmore, Donald L., and D.M. Giangreco. *Eyewitness Vietnam*. New York: Sterling, 2006.

Goodman, Walter. “Choose Your War; Or, the Case of the Selective C. O..” *New York Times*, March 23, 1969.

Guilmartin, John. “‘Tchepone’ A Fighter Jock Song.” *Songs of Americans in War*. http://faculty.buffalostate.edu/fishlm/folksongs/tchepone.htm.

“Hanoi Broadcasts Taped Voices Of 2 Identified as U.S. Pilots.” *New York Times*, August 31, 1965.

“Hanoi Dispatches to Times Criticized.” *New York Times*, January 1, 1967.

Harris, Lt Col William M. *End of Tour Report*, June 1972. Air Force Historical Research Agency, Maxwell AFB, AL.

Hartsook, Dr Elizabeth H. *The Air Force in Southeast Asia: The Administration Emphasizes Air Power 1969*, November 1971. http://www.foia.af.mil/shared/media/document/AFD-090904-074.pdf.

Harwood, Capt Richard J. *End of Tour Report*, December 9, 1969. Air Force Historical Research Agency, Maxwell AFB, AL.

Healy, Col Michael. E-mail. "Rescue," April 22, 2010.

Healy, Robert. "The Other Side of Vietnam." *Boston Globe*, January 22, 1982.

Hillenbrand, Barry. "CAMBODIA: Phnom-Penh's Pulse." *Time*, August 6, 1973..

Hoag, Maj Stuart H. *End of Tour Report*, January 1969. Air Force Historical Research Agency, Maxwell AFB, AL.

Hoi, Xuan. "Resolutely Charging Forward on the Roads—Hurricane-Like Attack Power." *Quan Doi Nhan Dan*, February 24, 1971.

Holcomb, Col Albert L. *End of Tour Report*, February 16, 1971. Air Force Historical Research Agency, Maxwell AFB, AL.

"Home of the Jolly Green Association." http://www.jollygreen.org/.

Hoon, Bruce. "Untitled." *P.O.V. - Re: Vietnam: Stories Since the War . Selected Stories | PBS*. http://www.pbs.org/pov/stories/vietnam/search.html.

Hughes, Toby. *Tchepone*. Tape. Cam Ranh Bay Air Base, 1968. http://www.pirtle.org/calli/tchepon.htm.

Hurley, Maj Phil C. *End of Tour Report*, November 24, 1968. Air Force Historical Research Agency, Maxwell AFB, AL.

Jayne, Randy, Buck Buchanan, and Ron Smith. "Recollections of the Nail 31 SAR." http://www.skyraider.org/hook/nail31ab/nail31.htm.

Jennings, Jerry. "Orgins [sic] of the name 'Jolly Green Giants'." http://www.jollygreen.org/Stories/orgins_of_the_name_jolly_green_g.htm.

Jensen, Lt Col Donald E. *End of Tour Report*, April 28, 1971. Air Force Historical Research Agency, Maxwell AFB, AL.

Jones, Maj Gerald A. *End of Tour Report*, December 9, 1969. Air Force Historical Research Agency, Maxwell AFB, AL.

Kamm, Henry. "On Ho Chi Minh Trail." *New York Times (1857-Current file)*, February 22, 1971.

Karnow, Stanley. "Viet Family Autocracy Coming Apart." *The Washington Post*, August 24, 1963, sec. A.

Kasler, Col James H. "The Hanoi POL Strike." *Air University Review* (December 1974).

Kellock, Capt Robert E. "Observations on the Conduct of the War," July 28, 1969. Historical Research Agency, Maxwell AFB, AL.

Kenworthy, E.W. "Eisenhower Says U.S. Aims Only at Military Targets." *New York Times*, December 28, 1966.

Kipp, Robert M. "Counterinsurgency From 30,000 Feet-the B-52 in Vietnam." *Air University Review* (February 1968).

Kitfield, James. *Prodigal Soldiers: How the Generation of Officers Born of Vietnam Revolutionized the American Style of War*. New York: Simon & Schuster, 1995.

Kneeland, Douglas E. "Capt. Noyd Is Sentenced to a Year at Hard Labor." *New York Times*, March 10, 1968.

Kosier, SMSgt Ed. "Reasons they Stay in the Air Force." *The Airman Magazine*, April 1967.

Langguth, Jack. "U.S. Planes Strike Closer to Hanoi." *New York Times*, July 3, 1965.

Laurence, Mike (pseud). Letter to Lydia Fish. "The Thud," January 7, 1994. http://faculty.buffalostate.edu/fishlm/folksongs/thud.htm.

"Leave Is Given Air Captain Who Opposed Vietnam War." *New York Times*, April 4, 1967.

Leong, Col Herbert. *End of Tour Report*. Air Force Historical Research Agency, Maxwell AFB, AL.

Letzkus, Richard. "Brigham." *505th Tactical Group*. http://www.squawk-flash.org/stories/brigham_festus.htm.

"Living on Air: How Khe Sanh Is Sustained." *Time*, March 1, 1968.

MacCartney, John. "Vietnam 1968 F-100 Pilot." *P.O.V. - Re: Vietnam: Stories Since the War . Selected Stories | PBS*. http://www.pbs.org/pov/stories/vietnam/search.html.

MACV. "Fire Support Coordination: Tactical Air Support - Part 1, 3, Appendix C." http://web.archive.org/web/20061030005647/www.gruntonline.com/US_Forces/US_Artillery/arty13.htm.

"Major Describes Move." *New York Times*, February 8, 1968.

Margolis, Howard. "Red Toll Disputed." *The Washington Post*, June 19, 1965.

Maurer, Harry. *Strange Ground: Americans in Vietnam, 1945-1975, an Oral History*. New York: H. Holt, 1989.

McGowan, Sam. "No, Bats are not blind!." *The Blind Bat Page*, 2002. http://web.archive.org/web/20070817150822/members.aol.com/BlndBat/menu.html.

McGuire, Col James. "Accurate Bombing: What if it Were True?." Air War College, Maxwell AFB, AL, 1970.

Merkling, Richard E. *End of Tour Report*. Air Force Historical Research Agency, Maxwell AFB, AL.

"Military Casualty Information." http://siadapp.dmdc.osd.mil/personnel/CASUALTY/castop.htm.

Miller, Col Carl S. *End of Tour Report*. Air Force Historical Research Agency, Maxwell AFB, AL.

Mitchum, Albert U. "Air Force pilots: Why do they stay?." The University of Alabama, 1995.

Modica, Lt Col Edward S. *End of Tour Report*, January 29, 1971. Air Force Historical Research Agency, Maxwell AFB, AL.

Moore, Col William E. *End of Tour Report*, December 1971. Air Force Historical Research Agency, Maxwell AFB, AL.

"Nakhon Phanom During The Secret War 1962-1975." http://aircommandoman.tripod.com/index.html.

"NARA Coffelt Database." *National Archives and Records Administration*, December 2005. http://aad.archives.gov/aad/.

"Nation: THE VALUE OF BOMBING THE NORTH." *Time*, December 16, 1966.

National Museum of the USAF. "Fact Sheet: AGM-78 Standard Antiradiation Missile." http://www.nationalmuseum.af.mil/factsheets/factsheet.asp?id=6004.

———. "Fact Sheet: Airman 1st Class William H. Pitsenbarger." http://www.nationalmuseum.af.mil/factsheets/factsheet_print.asp?fsID=1126&page=1.

———. "Fact Sheet: Fairchild C-123K Provider." http://www.nationalmuseum.af.mil/factsheets/factsheet_print.asp?fsID=310&page=1.

———. "Fact Sheet: Kaman HH-43B Huskie." http://www.nationalmuseum.af.mil/factsheets/factsheet.asp?id=306.

———. "Fact Sheet: The C-7A Caribou," May 1967. http://www.c-7acaribou.com/history/mem/caribou_fact_sheet.pdf.

———. "Fact Sheet: The Pioneers: Wild Weasel and the F-100F." http://www.nationalmuseum.af.mil/factsheets/factsheet.asp?id=14503.

Naugle, Berkley E. "First Flight Across the Fence." http://www.jollygreen.org/Stories/BerkleyNaugle/first_flight_across_the_fence.htm.

NAVAIR. "Standard Aircraft Characteristics Model O-1C." http://www.history.navy.mil/branches/hist-ac/o-1c.pdf.

Nelson, Derek. *Danger: Life and Death Stories from the US Navy Approach Magazine*. Osceola, WI: Motorbooks International, 1991.

Newman, Rick, and Don Shepperd. *Bury Us Upside down: The Misty Pilots and the Secret Battle for the Ho Chi Minh Trail*. New York: Presidio Press/Ballantine Books, 2006.

Noecker, Jeff. "The General," 1970. http://www.spectre-association.org/library/documents/war_stories/TheGeneral.pdf.

"Not Us, We're Not Going."

O'Gorman, Maj John P. "Battles are Bloody Maneuvers: A View from the Cockpit." *Air University Review,* October 1967.

"Olds Meets President, Talks with Press Corps." *Seventh Air Force News*. http://www.8tfw.com/pdfs/oldsmeetspress.pdf

Olds, Brig Gen Robin. "She's a Lady." *USAF Flying Safety*, August 1996.

Olds, Robin. Letter. "For The Fun Of It - A Few F-4 Pilots Would Climb It Vertically - Then Tail Slide," April 17, 2007.

Olds, Brig Gen Robin. "Briefing on Operation Bolo to Corona Harvest" presented at the Project Corona Harvest, Maxwell AFB, Ala, September 29, 1969.

Olds, Col Robin. *End of Tour Report*, November 27, 1967. Historical Research Agency.

One G - Predator Drivers (Once Upon a Time Fighter Pilots), 2009. http://www.youtube.com/watch?v=K5YD3BZO7Ys&feature=youtube_gdata_player.

"Operation Rescue." *Time*, March 12, 1965.

Osnos, Peter. "Numbers That Lied: CBS' Powerful Report On Vietnam Deception The Uncounted Enemy in Vietnam." *The Washington Post*, January 23, 1982.

"Oxford English Dictionary gomer, n.3." http://dictionary.oed.com.

"Oxford English Dictionary, gook." http://dictionary.oed.com.

Palmer, Dave Richard. *Summons of the Trumpet: U.S.-Vietnam in Perspective*. San Rafael, Calif: Presidio Press, 1978.

Parker, Maj Edward. *End of Tour Report*. Air Force Historical Research Agency, Maxwell AFB, AL.

"Peking Derides Raid." *New York Times*, June 19, 1965.

Perlmutter, Emanuel. "12 Clerics Criticize Johnson on Hanoi Bombing." *New York Times*, December 27, 1966.

"Phantom Flyer," June 22, 1968, Vol. III No. 17 edition. http://www.8tfw.com/pdfs/flyer62268.pdf.

Pilsch, Tom. "Search and Rescue." *Air Operations: Vietnam*. http://www.cc.gatech.edu/fac/Thomas.Pilsch/AirOps/sar.html.

———. "Visual Reconnaissance." *Air Operations: Vietnam*. http://www.cc.gatech.edu/fac/Thomas.Pilsch/AirOps/vr.html.

———. "Visual Reconnaissance." *Air Operations - Vietnam*. http://www.cc.gatech.edu/~tpilsch/AirOps/vr-sampan.html.

Pilsch, Tom, and Dick Coyner. "The Battle at Hua Cu: 11 October 1967, II Corps." *Air Operations: Vietnam*. http://www.cc.gatech.edu/fac/Thomas.Pilsch/AirOps/Herb13.html.

Pilsch, Tom, and Joe Sadowa. "Visual Reconnaissance: The Sunken Sampan, January 1968, III Corps." *Air Operations: Vietnam*. http://www.cc.gatech.edu/fac/Thomas.Pilsch/AirOps/vr-sampan.html.

Pinyerd, Col George C. *End of Tour Report*, July 2, 1971. Air Force Historical Research Agency, Maxwell AFB, AL.

Piowaty, John. "Reflections of a THUD Driver." *Air University Review* (February 1983). http://www.airpower.maxwell.af.mil/airchronicles/aureview/1983/Jan-Feb/piowaty.html.

Plunkett, Lt.Col. W. Howard. "562nd TFS - TAC's Strong Right Arm." *Air Force Musueum Friends Journal*, Winter -95 1994. http://www.geocities.com/Pentagon/7002/takhli65.html.

Pocock, Charlie, ed. *Cleared Hot: Forward Air Controller Stories from the Vietnam War*. Vol. 1. 2 vols. Forward Air Controllers Association, 2008.

Pocock, Charlie, ed. *Cleared Hot: Forward Air Controller Stories from the Vietnam War*. Vol. 2. 2 vols. Forward Air Controllers Association, 2008.

Pratt, John Clark, ed. *Vietnam Voices: Perspectives on the War Years, 1941-1982*. New York, N.Y: Penguin Books, 1984.

Quinlan, Edward G. *End of Tour Report*, December 2, 1969. Air Force Historical Research Agency, Maxwell AFB, AL.

Rasimus, Ed. Letter. "Dive Toss," 1998.

———. "Friendly Fire Notebook - Page 3 - AviationBanter." http://www.aviationbanter.com/showthread.php?t=8677&page=3.

Ratliff, John C. "Vietnam Stories." *P.O.V. - Re: Vietnam: Stories Since the War . Selected Stories | PBS*. http://www.pbs.org/pov/stories/vietnam/search.html.

Rauhe, Maj Bruce L. *End of Tour Report*, June 1969. Air Force Historical Research Agency, Maxwell AFB, AL.

Raymond, Chris "Snooze" Kurek and Rob "Trip". *Live at the Sand Trap*. Dos Gringos, 2003.

Raymond, Jack. "The Pilots of Danang Aren't 'Flyboys'." *New York Times*, August 15, 1965.

———. "VIGIL AT PENTAGON SCORES BOMBINGS." *New York Times*, May 13, 1965.

Reston, James. "Washington: It Was a Famous Victore.e.e." *New York Times*, June 20, 1965.

Ripley, Anthony. "PILOT WHO BALKED GETS A DISCHARGE." *New York Times*, February 9, 1973.

Rock, Edward T., ed. *First in, Last Out: Stories by the Wild Weasels*. Bloomington, IN: AuthorHouse, 2005.

Rose, Lt Col John G. "The Rosy Road to Vietnam." *Air Force Magazine*, December 1966.

Rosenbaum, Joel. "Weather Diary Cam Ranh Bay Airbase," September 28, 1968. http://www.c-7acaribou.com/history/483/crb_wx_diary.pdf.

Ruhl, Robert K. "The Man With Two Crosses." *The Airman Magazine*, October 1967.

"Rusk Says Planes Avoid China Border." *New York Times*, August 4, 1966.

Salisbury, Harrison E. "A VISITOR TO HANOI INSPECTS DAMAGE LAID TO U.S. RAIDS." *New York Times*, December 25, 1966.

———. "Bomb Controversy: View From the Ground." *New York Times*, January 13, 1967.

———. "Flak from Hanoi." *Time*, January 6, 1967.

———. “Hanoi Inviting Westerners To Inspect Bomb Damage.” *New York Times*, January 11, 1967.

———. “Hanoi Premier Tells View; Some in U.S. Detect a Shift.” *New York Times*, January 4, 1967.

———. “Hanoi Propaganda Stresses Tradition: War Against Odds.” *New York Times*, December 30, 1966.

———. “HANOI’S INDUSTRY BEING DISPERSED.” *New York Times*, January 14, 1967.

———. “No Military Targets, Namdinh Insists.” *New York Times*, December 31, 1966.

———. “U.S. Raids Batter 2 Towns; Supply Route Is Little Hurt.” *New York Times*, December 27, 1966.

———. “VILLAGERS TELL OF RAIDS IN NORTH.” *New York Times*, January 2, 1967.

Schell, Jonathan. *The Military Half: An Account of Destruction in Quang Ngai and Quang Tin*. Vintage Books, 1968.

———. *The Real War: The Classic Reporting on the Vietnam War with a New Essay*. New York: Da Capo Press, 2000.

Schiller, Bill, ed. *Red River Valley Fighter Pilots*. Paducah, KY: Turner Publishing Company, 2000.

Schipper, TSgt George E. *End of Tour Report*, August 1969. Air Force Historical Research Agency, Maxwell AFB, AL.

Schmidt, Dana Adams. “BRITON ACCUSES U.S. ON BOMBING.” *New York Times*, February 23, 1967.

Sharp, U. S. Grant. *Strategy for Defeat: Vietnam in Retrospect*. San Rafael, Calif: Presidio Press, 1978.

Shaw, Lt Col Dale, Col Clement E. Bellion, and Lt Col Leon M. Shaddox, eds. *The Legacy of Daedalus: War Stories and Flying Tales*. Paducah, KY: Turner Publishing Co, 2000.

Sheehan, Neil. “Foe Is Said to Use Haven near China.” *New York Times*, March 8, 1967.

———. “Raids’ Precision Seen in Reports.” *New York Times*, December 30, 1966.

———. “Senate Unit Reports Shortage of Bombs In Vietnam in 1966.” *New York Times*, March 29, 1967.

———. “Washington Concedes Bombs Hit Civilian Areas in North Vietnam.” *New York Times*, December 27, 1966.

Shepard, Elaine. *The Doom Pussy*. New York: Trident Press, 1967.

———. *The Doom Pussy II*. New York, N.Y: Rockoon Press, 1991.

Shepperd, Maj Gen Don. *Misty: First Person Stories of the F-100 Fast FACs in the Vietnam War*. Bloomington, IN: 1st Books Library, 2002.

Shore, Capt C. Wayne, Capt Charles R. Curran, Lt Col Forrest R. Ratliff, and Capt John R. Chiorini. *Proficiency Differences of Pilot and Navigator F-4 Second-Seat Crewmembers: A Southeast Asia Evaluation*. Brooks AFB, San Antonio, TX: Air Force Human Resources Lab, Lackland AFB, TX, April 1970.

Sibley, John. "EX-PILOT OF B-52 FIRM ON DECISION." *New York Times*, February 17, 1973.

Smith, Maj Bruce C. *End of Tour Report*, December 4, 1969. Air Force Historical Research Agency, Maxwell AFB, AL.

Smith, Maj Robert E. *End of Tour Report*, December 9, 1969. Air Force Historical Research Agency, Maxwell AFB, AL.

Stirling, John Bull. "Voodoo reconnaissance in the Vietnam War, 1966-1967." *Air Power History* 43, no. 4 (Winter 1996): 14.

Stoner, Col John R. "The Closer the Better." *Air University Review* (October 1967).

Stringer, Maj Harvie L. *End of Tour Report*, December 8, 1969. Air Force Historical Research Agency, Maxwell AFB, AL.

Sutton, Lt Col Stephen L. *End of Tour Report*, March 29, 1973. Air Force Historical Research Agency, Maxwell AFB, AL.

"Thailand Acknowledges Her Bases Are Used for U.S. Vietnam Raids." *New York Times*, March 10, 1967.

"Thats The Place." *Seventh Air Force News*. http://www.8tfw.com/pdfs/thatstheplace.pdf.

Thayer, Capt Willis J. *End of Tour Report*, November 24, 1969. Air Force Historical Research Agency, Maxwell AFB, AL.

"The War, The Presidency: Flak from Hanoi." *Time*, January 6, 1967..

"The War: The Great Bomb Flap." *Time*, December 23, 1966.

"The War: The Organization Man." *Time*, August 25, 1967.

"The World: See You in the Next War, Buddy." *Time*, August 27, 1973.

There Is a Way. 1352nd Photo Group, USAF Aerospace Audio Visual Service, 1967.

Thompson, Webb. *End of Tour Report*. Air Force Historical Research Agency, Maxwell AFB, AL.

Thorsness, Leo. "Speech to the Wild Weasel Reunion," Wild Weasel Reunion.

Toppings, Seymour. "Few Casualties Indicated in Raid on Reds by B-52's." *New York Times*, June 19, 1965.

Towery, Tommy. Letter. "Arc Light," August 8, 2010.

Towery, Tommy, ed. *We Were Crewdogs - The Vietnam Collection*. Memphis, TN: Tommy Towery, 2008.

———. *We Were Crew Dogs I*. Memphis, TN: Tommy Towery, 2007.

———. *We Were Crewdogs V*. Memphis, TN: Tommy Towery, 2009.

Townsley, Bill. "Shoot Down of Covey 264." *Air War Vietnam*. http://airwarvietnam.com/faccovey264.htm.

———. "The Essence of Forward Air Controlling." *Air War Vietnam*. http://airwarvietnam.com/faccovey264a.htm.

Trippe, Maj William. *End of Tour Report*, December 11, 1969. Air Force Historical Research Agency, Maxwell AFB, AL.

Tuso, Joseph F. "A Folk Drama - "What the Captain Means Is..." Or That Interview You Never Saw on TV." *Folklore Forum* 5, no. 1 (1972). https://scholarworks.iu.edu/dspace/handle/2022/1184.

U.S. Air Force Fact Sheet : "B-66 Flight Engineers." http://www.nationalmuseum.af.mil/factsheets/factsheet.asp?id=13859.

U.S. Air Force Fact Sheet: "Badge of Honor: 100 Missions up North." http://www.nationalmuseum.af.mil/factsheets/factsheet.asp?id=13848.

U.S. Air Force Fact Sheet: "Officer Training School." http://www.af.mil/information/factsheets/factsheet_print.asp?fsID=4703&page=1.

U.S. Air Force Personnel Center Fact Sheet: "Air Force Cross." http://www.afpc.randolph.af.mil/library/factsheets/factsheet.asp?id=7726.

U.S. Department of Defense. "News Release: B-2 REACHES INITIAL OPERATIONAL CAPABILITY." http://www.defense.gov/releases/release.aspx?releaseid=1202.

"U.S. Military Casualties in Southeast Asia - Deaths by Casualty Type and Service." *The Vietnam Veterans Memorial - The Wall-USA*. http://thewall-usa.com/summary.asp.

"U.S. Plans to Build Vietnam 'Fence' to Curb Infiltration From North, McNamara Says." *Wall Street Journal*, September 8, 1967.

"U.S. VOICES REGRETS IF BOMBS HIT HANOI." *New York Times*, December 23, 1966.

"U.S. Woman, Home, Reports on Trip to Hanoi." *New York Times*, January 9, 1967.

United States Air Force Division Air Liaison Office, 4th Infantry Division. *Vietnam Lessons Learned No. 77: Fire Support Coordination in the Republic of Vietnam Appendix 2: General Air Munitions Data*, June 1, 1969.

USAF. "T-41 Checklist T.O. 1T-41C-1CL." http://www.fortmeadeflyingactivity.org/docs/t41c_usaf_checklist.pdf.

"Valor awards for Joseph B. Madden: Military Times Hall of Valor." http://militarytimes.com/citations-medals-awards/recipient.php?recipientid=3582.

"Valor awards for Thomas Dayton: Military Times Hall of Valor." http://militarytimes.com/citations-medals-awards/recipient.php?recipientid=3622.

Vaughan, David K. "Flying the C-130 Hercules in Vietnam." *Aerospace Historian* (June 1985).

"VISITOR DESCRIBES NAMDINH DAMAGE." *New York Times*, January 20, 1967.

Vojvodich, Mele. *End of Tour Report*. Air Force Historical Research Agency, Maxwell AFB, AL.

"War's 24th Top Medal Will Be Awarded Today." *The Washington Post*, January 24, 1968.

Watts, Barry. "Unreported History and Unit Effectiveness." *The Journal of Strategic Studies* Vol 12, no. No 1 (1989): 88-98.

Watts, Claudius. "Aerial Resuply for Khe Sanh." *Military Review* (December 1972). http://calldp.leavenworth.army.mil/eng_mr/txts/VOL52/00000012/art10.pdf.

Weeden, Maj Dale N. *End of Tour Report*, December 8, 1969. Air Force Historical Research Agency, Maxwell AFB, AL.

Weintraub, Bernard. "COURT CONVICTS OFFICER." *New York Times*, July 14, 1971.

Welles, Benjamin. "Vietnam Bomb Shortage Is Denied by McNamara." *New York Times*, April 15, 1966.

Wetterhahn, Ralph F. "Change of Command." *Air & Space Smithsonian* 12, no. 3 (August): 62.

"Widow of Air Force Pilot To Get His Medal of Honor." *New York Times*, January 24, 1968.

Wyndham, Maj Buck. "Warbird Alley: Northrop T-38 Talon Pilot Report." http://www.warbirdalley.com/articles/t38pr.htm.

"YouTube - The Super Chicken Cartoon Theme Song." http://www.youtube.com/watch?v=FKss2pBYQ6Y.

Zehnder, Col Herbert R. *End of Tour Report*, December 15, 1973. Air Force Historical Research Agency, Maxwell AFB, AL.

Zeybel, Lt Col Henry. "Truck Count." *Air University Review* (February 1983).

Zipf, Dr. R. Karl, and Kenneth L. Cashdollar. *Effects of blast pressure on structures and the human body*.

"Zone Raided Daily, U.S. Says." *New York Times (1923-Current file)*, August 21, 1966.

Zook, Lt Col David S. "Seven Years of Vietnam a Raven Goes to War." http://freepages.military.rootsweb.ancestry.com/~ocs60c/Zookraven.htm.

Official Histories

Abbey, Thomas G. *Attack on Cam Ranh: 25 August 1971*. CHECO Contemporary Historical Evaluation of Combat Operations, December 15, 1971. Air Force Historical Research Agency, Maxwell AFB, AL.

Adamcik, Frank J. *Short Rounds*. CHECO Contemporary Historical Evaluation of Combat Operations, July 15, 1972. Defense Technical Information Center.

Anderegg, C. R. *Sierra Hotel: Flying Air Force Fighters in the Decade After Vietnam*. Washington, DC: Air Force History and Museums Program, United States Air Force, 2001.

Anderson, Capt B. Conn. *USAF Search and Rescue in Southeast Asia (1961-66)*. CHECO Contemporary Historical Evaluation of Combat Operations, October 24, 1966. Historical Research Agency, Maxwell AFB, AL.

Ballard, Jack S. *The Development and Employment of Fixed-Wing Gunships, 1962-1972*. United States Air Force in Southeast Asia. Washington DC: Office of Air Force History, United States Air Force, 1982.

Bonetti, Lee. *The War in Vietnam: January - June 1967*. CHECO Contemporary Historical Evaluation of Combat Operations. Air Force Historical Research Agency, Maxwell AFB, AL.

Bonetti, Lee, A. W. Thompson, Melvin F. Porter, and C. William Thorndale. *The War in Vietnam: July-December 1967*. CHECO Contemporary Historical Evaluation of Combat Operations, November 29, 1968. Air Force Historical Research Agency, Maxwell AFB, AL.

Bowers, Ray L. *Tactical Airlift*. The United States Air Force in Southeast Asia. Washington, DC: Office of Air Force History, United States Air Force, 1983.

Breitling, Patrick J. *Guided Bomb Operations in SEA: The Weather Dimension, 1 February - 31 December 1972*. CHECO Contemporary Historical Evaluation of Combat Operations, October 1, 1973. Air Force Historical Research Agency, Maxwell AFB, AL.

Burditt, William R. *Rules of Engagement: October 1972 - August 1973*. CHECO Contemporary Historical Evaluation of Combat Operations, March 1, 1977. Air Force Historical Research Agency, Maxwell AFB, AL.

———. *Short Rounds: January 1972 - August 1973*. CHECO Contemporary Historical Evaluation of Combat Operations, November 1, 1977. Air Force Historical Research Agency, Maxwell AFB, AL.

Caine, Maj Philip D. *Igloo White: July 1968 - December 1969*. CHECO Contemporary Historical Evaluation of Combat Operations, January 10, 1970. Air Force Historical Research Agency, Maxwell AFB, AL.

Cole, Capt James L. *Fixed Wing Gunships in SEA (Jul 69 - Jul 71)*. CHECO Contemporary Historical Evaluation of Combat Operations, November 30, 1971. Historical Research Agency, Maxwell AFB, AL.

Dennison, John W., and Melvin F. Porter. *Local Base Defense in RVN, January 1969-June 1971*. CHECO Contemporary Historical Evaluation of Combat Operations, September 14, 1971. Air Force Historical Research Agency, Maxwell AFB, AL.

Durkee, Maj Richard A. *Combat Skyspot*. CHECO Contemporary Historical Evaluation of Combat Operations, August 9, 1967. Air Force Historical Research Agency, Maxwell AFB, AL.

———. *USAF Search and Rescue: July 1966 - November 1967*. CHECO Contemporary Historical Evaluation of Combat Operations, January 19, 1968. Historical Research Agency, Maxwell AFB, AL.

Elder, Paul W., and Peter J. Melly. *Rules of Engagement: November 1969 - September 1972*. CHECO Contemporary Historical Evaluation of Combat Operations, March 1, 1973. Air Force Historical Research Agency, Maxwell AFB, AL.

Francis, David G., and David R. Nelson. *Search and Rescue Operations in SEA: 1 April 1972 - 30 June 1973*. CHECO Contemporary Historical Evaluation of Combat Operations, November 27, 1974. Air Force Historical Research Agency, Maxwell AFB, AL.

Futrell, Robert Frank. *The Advisory Years to 1965*. The United States Air Force in Southeast Asia. Washington, DC: Office of Air Force History, United States Air Force, 1981.

Futrell, Robert Frank, James N Eastman, Walter K Hanak, and Lawrence J Paszek. *Aces & Aerial Victories: The United States Air Force in Southeast Asia, 1965-1973*. Maxwell Air Force Base, AL: Albert F. Simpson Historical Research Center, Air University, 1976.

Gatlin, Jesse C. *Igloo White (Initial Phase)*. CHECO Contemporary Historical Evaluation of Combat Operations, July 31, 1968. Defense Technical Information Center.

Gilster, Herman L. *The Air War in Southeast Asia: Case Studies of Selected Campaigns*. Maxwell Air Force Base, AL: Air University Press, 1993.

Glasser, Jeffrey D. *The Secret Vietnam War: The United States Air Force in Thailand, 1961-1975*. Jefferson, NC: McFarland & Co, 1995.

Gropman, Alan L. *Airpower and the Airlift Evacuation of Kham Duc*. USAF Southeast Asia Monograph Series. Washington, DC: Office of Air Force History, United States Air Force, 1985.

Harrison, Philip R. *Impact of Darkness and Weather on Air Operations in SEA*. CHECO Contemporary Historical Evaluation of Combat Operations, March 10, 1969. Historical Research Agency, Maxwell AFB, AL.

Heffron, Lt Charles H. *Air-to-Air Encounters Over North Vietnam: 1 January - 30 June 1967*. CHECO Contemporary Historical Evaluation of Combat Operations, November 30, 1967. Air Force Historical Research Agency, Maxwell AFB, AL.

Humphries, Jack T. *USAF Aerial Port Operations in RVN*. CHECO Contemporary Historical Evaluation of Combat Operations, August 5, 1970. Air Force Historical Research Agency, Maxwell AFB, AL.

Johnson, Calvin R. *LINEBACKER Operations, September - December 1972*. CHECO Contemporary Historical Evaluation of Combat Operations, December 31, 1978. Defense Technical Information Center.

Knaack, Marcelle S. *Encyclopedia of US Air Force Aircraft and Missile Systems*. Washington DC: Office of Air Force History, United States Air Force, 1978.

Knaack, Marcelle Size. *Post-World War II Bombers*. Vol. 2. Encyclopedia of US Air Force Aircraft and Missile Systems. Washington DC: Office of Air Force History, United States Air Force, 1978.

Knott, Richard F., Johnson, Jr Lippincott, and Seig. *Forward Airfields for Tactical Airlift in SEA*. CHECO Contemporary Historical Evaluation of Combat Operations, June 15, 1970. Historical Research Agency, Maxwell AFB, AL.

Layton, Capt Bruce. *Commando Hunt VI*. CHECO Contemporary Historical Evaluation of Combat Operations, July 7, 1972. Air Force Historical Research Agency, Maxwell AFB, AL.

Lee, Richard R. *7AF Local Base Defense Operations: July 1965-December 1968*. CHECO Contemporary Historical Evaluation of Combat Operations, July 1, 1969. Air Force Historical Research Agency, Maxwell AFB, AL.

Lowe, LeRoy W. *Search and Rescue Operations in SEA: 1 January 1971 - 31 March 1972*. CHECO Contemporary Historical Evaluation of Combat Operations, October 17, 1972. Air Force Historical Research Agency, Maxwell AFB, AL.

Mark, Eduard Maximilian. *Aerial Interdiction: Air Power and the Land Battle in Three American Wars*. Washington, DC: Center for Air Force History, 1994.

Martin, Lt Col Albert S. *SAR Effort Report (Boxer 22 Alpha and Bravo)*. Corona Harvest, January 16, 1970. Air Force Historical Research Agency, Maxwell AFB, AL.

Melyan, Wesley R., and Lee Bonetti. *Rolling Thunder: July 1965 - December 1966*. CHECO Contemporary Historical Evaluation of Combat Operations, July 15, 1967. Air Force Historical Research Agency, Maxwell AFB, AL.

———. *The War in Vietnam: 1966*. CHECO Contemporary Historical Evaluation of Combat Operations, October 23, 1967. Historical Research Agency, Maxwell AFB, AL.

Merrell, Ronald D. *Tactical Airlift in SEA*. CHECO Contemporary Historical Evaluation of Combat Operations, February 15, 1972. Air Force Historical Research Agency, Maxwell AFB, AL.

Mets, David R. *Tactical Airlift Operations*. CHECO Contemporary Historical Evaluation of Combat Operations, June 30, 1969. Historical Research Agency, Maxwell AFB, AL.

Montagliani, Ernie S. *Airmunitions in SEA*. CHECO Contemporary Historical Evaluation of Combat Operations, November 15, 1969. Air Force Historical Research Agency, Maxwell AFB, AL.

Nalty, Bernard C. *Air War Over South Vietnam, 1968-1975*. Washington, DC: Air Force History and Museums Program, 2000.

Nalty, Bernard C. *Air Power and the Fight for Khe Sanh*. Washington DC: Office of Air Force History, United States Air Force, 1973.

———. *Air Power and the Fight for Khe Sanh*. Washington, DC: Government Reprints Press, 2001.

———. *The War Against Trucks: Aerial Interdiction in Southern Laos, 1968-1972*. Washington, DC: Air Force History and Museums Program, United States Air Force, 2005.

Office of History and Research. "Major Changes in Undergraduate Pilot Training 1939-2002." Headquarters Air Education and Training Command Randolph AFB, TX. http://www.aetc.af.mil/shared/media/document/AFD-070130-081.pdf.

Overton, James B. *USAF Search and Rescue: November 1967 - June 1969*. CHECO Contemporary Historical Evaluation of Combat Operations, July 30, 1969. Defense Technical Information Center.

Overton, James B. *FAC Operations in Close Air Support Role in SVN*. CHECO Contemporary Historical Evaluation of Combat Operations, January 31, 1969. Air Force Historical Research Agency, Maxwell AFB, AL.

Overton, Maj James B. *Rolling Thunder: January 1967 - November 1968*. CHECO Contemporary Historical Evaluation of Combat Operations, October 1, 1969. Air Force Historical Research Agency, Maxwell AFB, AL.

———. *Rolling Thunder: January 1967 to November 1968*. CHECO Contemporary Historical Evaluation of Combat Operations, October 1969. Air Force Historical Research Agency, Maxwell AFB, AL.

Paterson, L. E. *Evolution of the Rules of Engagement for Southeast Asia: 1960-1965*. CHECO Contemporary Historical Evaluation of Combat Operations, September 30, 1966. Air Force Historical Research Agency, Maxwell AFB, AL.

Porter, Capt Melvin F. *Tiger Hound*. CHECO Contemporary Historical Evaluation of Combat Operations, September 6, 1966. Historical Research Agency, Maxwell AFB, AL.

Porter, Melvin F. *Control of Airstrikes: January 1967 - December 1968*. CHECO Contemporary Historical Evaluation of Combat Operations, June 30, 1969. Historical Research Agency, Maxwell AFB, AL.

———. *Night Interdiction in Southeast Asia*. CHECO Contemporary Historical Evaluation of Combat Operations, September 9, 1966. Air Force Historical Research Agency, Maxwell AFB, AL.

———. *Second Generation Weaponry in SEA*. CHECO Contemporary Historical Evaluation of Combat Operations, September 10, 1970. Defense Technical Information Center.

Potter, Joseph V. *OV-10 Operations in SEAsia*. CHECO Contemporary Historical Evaluation of Combat Operations, September 15, 1969. Defense Technical Information Center.

Pralle, Maj James B. *ARC Light: Jun 1967-Dec 1968*. CHECO Contemporary Historical Evaluation of Combat Operations, August 15, 1969. Air Force Historical Research Agency, Maxwell AFB, AL.

Pratt, Major John C. *Air Tactics Against NVN Air Ground Defenses: December 1966-1 November 1968*. CHECO Contemporary Historical Evaluation of Combat Operations, August 30, 1969. Air Force Historical Research Agency, Maxwell AFB, AL.

———. *Air Tactics Against NVN Air Ground Defenses: December 1966-1 November 1968, Supporting Documents*. CHECO Contemporary Historical Evaluation of Combat Operations, August 30, 1969. Air Force Historical Research Agency, Maxwell AFB, AL.

Project CHECO, 7AF DOAC. *Short Rounds and Related Incidents: 1 Jun 69 to 31 Dec 70*. CHECO Contemporary Historical Evaluation of Combat Operations, February 15, 1971. Historical Research Agency, Maxwell AFB, AL.

Rochester, Stuart I. *Honor Bound: American Prisoners of War in Southeast Asia, 1961-1973*. Annapolis, MD: Naval Institute Press, 1999.

Sams, K., J. Schlight, R. F Kott, M. J Mendelsohn, and P. D Caine. *The Air War in Vietnam: 1968 - 1969*. CHECO Contemporary Historical Evaluation of Combat Operations, April 1, 1970. Historical Research Agency, Maxwell AFB, AL.

Sams, Kenneth, and Maj A.W. Thompson. *Kham Duc*. CHECO Contemporary Historical Evaluation of Combat Operations, July 8, 1968. Air Force Historical Research Agency, Maxwell AFB, AL.

Sayers, William. "The Red Baron Reports: What They Really Said." *Air Power History* 52, no. 3 (Fall 2005): 4.

Schlatter, J. D. *Short Rounds: June 1968 - May 1969*. CHECO Contemporary Historical Evaluation of Combat Operations, August 15, 1969. Defense Technical Information Center.

Schlight, John. *A War Too Long: The USAF in Southeast Asia, 1961-1975*. Air Force fiftieth anniversary commemorative ed. Washington, DC: Air Force History and Museums Program, 1996.

———. *Jet Forward Air Controllers in SEAsia*. CHECO Contemporary Historical Evaluation of Combat Operations, October 15, 1969. Air Force Historical Research Agency, Maxwell AFB, AL.

———. *The War in South Vietnam: The Years of the Offensive, 1965-1968*. The United States Air Force in Southeast Asia. Washington, DC: Office of Air Force History, United States Air Force, 1988.

Schlight, Lt Col John. *Rescue at Ban Phanop*. CHECO Contemporary Historical Evaluation of Combat Operations, February 15, 1970. Air Force Historical Research Agency, Maxwell AFB, AL.

Seig, Louis. *Impact of Geography on Air Operations in SEA*. CHECO Contemporary Historical Evaluation of Combat Operations, June 11, 1970. Historical Research Agency, Maxwell AFB, AL.

Shields, Henry S. *Igloo White: January 1970-September 1971*. CHECO Contemporary Historical Evaluation of Combat Operations, November 1, 1971. Defense Technical Information Center.

Shore, Capt Moyers S. *The Battle for Khe Sanh*. Washington DC: Historical Branch, G-3 Division, Headquarters, U.S. Marine Corps, 1969.

Southeast Asia Team. *Rolling Thunder: March - June 1965*. CHECO Contemporary Historical Evaluation of Combat Operations, March 28, 1966. Historical Research Agency, Maxwell AFB, AL.

Thompson, Maj A. W. *The Defense of Saigon*. CHECO Contemporary Historical Evaluation of Combat Operations, December 14, 1968. Historical Research Agency, Maxwell AFB, AL.

Thompson, Maj A. W., and C. William Thorndale. *Air Response to the Tet Offensive: 30 January - 29 February 1968*. CHECO Contemporary Historical Evaluation of Combat Operations, August 12, 1968. Air Force Historical Research Agency, Maxwell AFB, AL.

———. *Air Response to the TET Offensive: Supporting Documents vol. 3*. CHECO Contemporary Historical Evaluation of Combat Operations, June 19, 1968. Air Force Historical Research Agency, Maxwell AFB, AL.

———. *Air Response to the TET Offensive: Supporting Documents vol. 2*. CHECO Contemporary Historical Evaluation of Combat Operations. Air Force Historical Research Agency, Maxwell AFB, AL.

Thompson, Wayne. *To Hanoi and Back: The United States Air Force and North Vietnam, 1966-1973*. Washington, DC: Smithsonian Institution Press, 2000.

Thorndale, C. William. *Air War in the DMZ: September 1967 - June 1968*. CHECO Contemporary Historical Evaluation of Combat Operations, August 1, 1969. Air Force Historical Research Agency, Maxwell AFB, AL.

———. *Battle for DAK TO*. CHECO Contemporary Historical Evaluation of Combat Operations, June 21, 1968. Air Force Historical Research Agency, Maxwell AFB, AL.

———. *Defense of Da Nang*. CHECO Contemporary Historical Evaluation of Combat Operations, August 31, 1969. Historical Research Agency, Maxwell AFB, AL.

———. *Interdiction in Route Package One, 1968*. CHECO Contemporary Historical Evaluation of Combat Operations, June 30, 1969. Historical Research Agency, Maxwell AFB, AL.

———. *Interdiction in SEASIA, November 1966 - October 1968*. CHECO Contemporary Historical Evaluation of Combat Operations, June 30, 1969. Air Force Historical Research Agency, Maxwell AFB, AL.

Tilford, Earl H. *Search and Rescue in Southeast Asia*. Washington DC: Office of Air Force History, United States Air Force, 1980.

———. *Setup: What the Air Force Did in Vietnam and Why*. Maxwell Air Force Base, AL: Air University Press, 1991.

Till, and Thomas. *PAVE AEGIS Weapon System (AC-130E Gunship)*. CHECO Contemporary Historical Evaluation of Combat Operations, July 30, 1973. Historical Research Agency, Maxwell AFB, AL.

Trest, Warren A. *Khe Sanh (Operation Niagara) Vol. 1*. CHECO Contemporary Historical Evaluation of Combat Operations, September 13, 1968. Air Force Historical Research Agency, Maxwell AFB, AL.

———. *Khe Sanh (Operation Niagara) Vol. 2*. CHECO Contemporary Historical Evaluation of Combat Operations, September 13, 1968. Air Force Historical Research Agency, Maxwell AFB, AL.

———. *Khe Sanh (Operation Niagara) Vol.3*. CHECO Contemporary Historical Evaluation of Combat Operations, September 13, 1968. Air Force Historical Research Agency, Maxwell AFB, AL.

Trest, Warren A. *USAF SAC Operations in Support of SEAsia*. CHECO Contemporary Historical Evaluation of Combat Operations, December 17, 1969. Air Force Historical Research Agency, Maxwell AFB, AL.

Tunner, William H. *Over the Hump*. Washington, DC: Office of Air Force History, United States Air Force, 1985.

Vallentiny, E., and D. G. Francis. *Attack on Udorn*. CHECO Contemporary Historical Evaluation of Combat Operations, December 27, 1968. Air Force Historical Research Agency, Maxwell AFB, AL.

Van Staaveren, Jacob. *Gradual Failure: The Air War Over North Vietnam, 1965-1966*. The United States Air Force in Southeast Asia. Washington, DC: Air Force History and Museums Program, 2002.

———. *Interdiction in Southern Laos, 1960-1968: The United States Air Force in Southeast Asia*. Washington, DC: Center for Air Force History, 1993.

———. *The Air Force in Vietnam: The Search for Alternatives*. Washington DC: Office of Air Force History, United States Air Force, December 1969.

Weaver, Robert B. *Air-to-Air Encounters over North Vietnam: 1 July 1967-31 December 1968*. CHECO Contemporary Historical Evaluation of Combat Operations, August 30, 1969. Historical Research Agency, Maxwell AFB, AL.

Webb, Willard J. *History of the Joint Chiefs of Staff: The Joint Chiefs of Staff and the War in Vietnam, 1969-1970*. Washington, DC: Office of Joint History, Office of the Chairman of the Joint Chiefs of Staff, 2002.

Werrell, Kenneth P. *Archie, Flak, AAA, and SAM: A Short Operational History of Ground-Based Air Defense*. Maxwell Air Force Base, AL: Air University Press, 1988.

Whitaker, B. A., and L. E Paterson. *Assault Airlift Operations*. CHECO Contemporary Historical Evaluation of Combat Operations, February 23, 1967. Historical Research Agency, Maxwell AFB, AL.

Winged Shield, Winged Sword: A History of the United States Air Force. Washington, D.C: Air Force History and Museums Program, United States Air Force, 1997.

Wright, Monte D. *USAF Tactics Against Air & Ground Defenses in SEA: November 1968 - May 1970*. CHECO Contemporary Historical Evaluation of Combat Operations, September 25, 1970. Air Force Historical Research Agency, Maxwell AFB, AL.

Secondary Sources

Algeo, John, and Adele Algeo. "Among the New Words." *American Speech* 64, no. 2 (Summer 1989): 150-161.

Appy, Christian G. *Patriots: The Vietnam War Remembered from All Sides*. Penguin, 2004.

———. *Working-Class War: American Combat Soldiers and Vietnam*. Chapel Hill: University of North Carolina Press, 1993.

Ashcroft, Dr. Bruce. "We Wanted Wings: A History of the Aviation Cadet Program." Randolph AFB, TX, 2005. Headquarters Air Education and Training Command, Office of History and Research.

Balkind, Jonathan Jacob. "MORALE DETERIORATION IN THE UNITED STATES MILITARY DURING THE VIETNAM PERIOD." University of California, Los Angeles, 1978.

Bartov, Omer. *The Eastern Front, 1941-45: German Troops and the Barbarisation of Warfare*. New York: St. Martin's Press, 1986.

Baskir, Lawrence M. *Chance and Circumstance: The Draft, the War, and the Vietnam Generation*. New York: Vintage Books, 1978.

Berg, Paul Darien. "Assessing the United States Air Force Bombing Effectiveness During Rolling Thunder." Ph.D. dissertation, Auburn University, 2001.

Bourke, Joanna. *An Intimate History of Killing: Face-to-Face Killing in Twentieth-Century Warfare*. New York: Basic Books, 1999.

Bowden, Mark. *Black Hawk down: A Story of Modern War*. New York: Atlantic Monthly Press, 1999.

Bowman, James. *Honor: A History*. Encounter Books, 2007.

Bowman, James. "Honor: A Talk Given at the American Enterprise Institute, Washington, D.C.," American Enterprise Institute, Washington, D.C., May 8, 2006. http://www.jamesbowman.net/reviewDetail.asp?pubID=1759.

Brigham, Robert K. *ARVN: Life and Death in the South Vietnamese Army*. Modern war studies. Lawrence: University Press of Kansas, 2006.

———. "Why the South Won the American War in Vietnam." In *Why the North Won the Vietnam War*, edited by Marc Gilbert.

Casey, Aloysius, and Patrick Casey. "Lavelle, Nixon, and the White House Tapes." *Air Force*, February 2007. http://www.afa.org/magazine/feb2007/0207tapes.asp.

Castle, Timothy N. *One Day Too Long: Top Secret Site 85 and the Bombing of North Vietnam*. New York: Columbia University Press, 1999.

Chong, Denise. *The Girl in the Picture: The Story of Kim Phuc, the Photograph, and the Vietnam War*. New York: Viking, 2000.

Churchill, Jan. *Hit My Smoke! Forward Air Controllers in Southeast Asia*. Manhattan, KS: Sunflower University Press, 1997.

Clodfelter, Mark. *The Limits of Air Power: The American Bombing of North Vietnam*. New York: Free Press, 1989.

Coram, Robert. *American Patriot: The Life and Wars of Colonel Bud Day*. New York: Little, Brown and Company, 2007.

Correll, John. "Lavelle." *Air Force Magazine*, November 2006.

Correll, John T. *The Air Force in the Vietnam War*. Arlington, VA: The Air Force Association, December 2004.

Crane, Conrad C. *Bombs, Cities, and Civilians: American Airpower Strategy in World War II*. Modern War Studies. Lawrence, KS: University Press of Kansas, 1993.

Davis, Larry. *Wild Weasel: The SAM Suppression Story*. Rev. ed. Vietnam studies group. Carrollton, TX: Squadron/Signal Publications, 1993.

DeBenedetti, Charles. *An American Ordeal: The Antiwar Movement of the Vietnam Era*. Syracuse, N.Y: Syracuse University Press, 1990.

DeRemer, Lee E. "Leadership Between a Rock and a Hard Place." *Airpower Journal* 10, no. 3 (Fall 1996): 87.

Dorr, Robert F. *Air Combat: A History of Fighter Pilots*. Reprint. New York: Berkley Trade, 2007.

———. *Vietnam: Combat from the Cockpit*. Osceola, WI: Motorbooks International, 1989.

Dower, John. *War Without Mercy: Race and Power in the Pacific War*. New York: Pantheon, 1986.

Duiker, William J. *Sacred War: Nationalism and Revolution in a Divided Vietnam*. New York: McGraw-Hill, 1995.

Dully, Dr. Frank E. "Managing Pilots: An Art and a Science," Flight Safety Foundation, unknown . http://www.phoenixaviation.ca/Managing%20Pilots.pdf.

Dully, Frank E. "The Life Style Keys to Flight Deck Performance of the Naval Aviator — Another Window." Naval Air Station Pensacola, FL, est 1985. Naval Aerospace Medical Institute.

Ebert, James R. *A Life in a Year: The American Infantryman in Vietnam, 1965-1972*. Novato, CA: Presidio Press, 1993.

English, Dave. *The Air Up There: More Great Quotations on Flight*. New York: McGraw-Hill, 2003.

Ferris, Keith. *The Aviation Art of Keith Ferris*. Peacock Press/Bantam Books, 1979.

Fields, Kenny Wayne. *Rescue of Streetcar 304: A Navy Pilot's Forty Hours on the Run in Laos*. Naval Institute Press, 2008.

Fish, Lydia. "Songs of the Air Force in the Vietnam War," April 15, 1996. http://faculty.buffalostate.edu/fishlm/folksongs/afsong.htm.

Fish, Lydia M. "General Edward G. Lansdale and the Folksongs of Americans in the Vietnam War." *The Journal of American Folklore* 102, no. 406 (December 1989): 390-411.

Floyd, Jeffrey B. *For Extraordinary Heroism: The Air Force Cross*. Alexandria, VA: J.B. Floyd, 1982.

Frankum, Ronald Bruce. *Like Rolling Thunder: The Air War in Vietnam, 1964-1975*. Vietnam--America in the war years v.3. Lanham, MD: Rowman & Littlefield, 2005.

Freedman, Lawrence. "Vietnam and the Disillusioned Strategist." *International Affairs* 72, no. 1 (January 1996): 133-151.

Frisbee, John L. "The Pinnacle of Professionalism." *Air Force Magazine*, February 1987.

———. "Valor: Pardo's Push." *Air Force Magazine*, October 1996.

Fritz, Stephen G. *Frontsoldaten: The German Soldier in World War II*. Lexington: University Press of Kentucky, 1995.

Gelpi, Paul Dunbar. "Forging the Sword: Tactical Air Power and the United States Military Experience, 1950--1961." Ph.D. dissertation, The University of Alabama, 2002.

Gibson, James William. *The Perfect War*. New York: Atlantic Monthly Press, 2000.

Grady, Maj Walter Anthony. "The Moral Domain of War: A View from the Cockpit." Air University, Maxwell AFB, AL, May 1993. School of Advanced Airpower Studies.

Gray, J. Glenn. *The Warriors: Reflections on Men in Battle*. Harcourt, Brace, 1959.

Grinker, Roy R, and John Paul Spiegel. *Men Under Stress*. Philadelphia: Blakiston, 1945.

Gropman, Alan L. *The Air Force Integrates, 1945-1964*. Washington, DC: Office of Air Force History, United States Air Force, 1985.

Grossman, Dave, and Loren W. Christensen. *On Combat: The Psychology and Physiology of Deadly Conflict in War and in Peace*. PPCT Research Publications, 2004.

Grossman, Lt. Col. Dave. *On Killing: The Psychological Cost of Learning to Kill in War and Society*. Boston: Little, Brown and Company, 1995.

Hagedorn, Hermann. *Sunward I've Climbed: The Story of John Magee, Poet and Soldier, 1922-1941*. The Macmillan Company, 1942.

Halberstam, David. *The Best and the Brightest*. New York: Random House, 1972.

Hamilton, Maj Phillip T. "Fear and Loathing in the Air: Combat Fear and Stress in the Air Force." Air University, Maxwell AFB, AL, June 2005. School of Advanced Air and Space Studies.

Hammel, Eric M. Khe Sanh: Siege in the Clouds: An Oral History. Pacifica, CA: Pacifica Press, 2000.

Hammond, William M. *Reporting Vietnam: Media and Military at War*. Modern war studies. Lawrence, Kan: University Press of Kansas, 1998.

Hannah, Craig C. *Striving for Air Superiority: The Tactical Air Command in Vietnam*. Texas A & M University Military History Series 76. College Station: Texas A&M University Press, 2002.

Hathorn, Reginald. *Here There Are Tigers: The Secret Air War in Laos, 1968-69*. Mechanicsburg, PA: Stackpole Books, 2008.

Haun, Phil. "Misty FACs of the Vietnam War." *Air Power History* 50, no. 4 (Winter 2003): 38.

Head, William P. *Shadow and Stinger: Developing the AC-119G/K Gunships in the Vietnam War*. Texas A & M University military history series 109. College Station: Texas A&M University Press, 2007.

Herring, George C. *America's Longest War: The United States and Vietnam, 1950-1975*. New York: Wiley, 1979.

Hobson, Chris. *Vietnam Air Losses: United States Air Force, Navy and Marine Corps Fixed-Wing Aircraft Losses in Southeast Asia 1961-1973*. Hinckley, England: Midland, 2001.

Holmes. *Acts of War: The Behavior of Men in Battle*. New York: Free Press, 1986.

Horwood, Ian. *Interservice Rivalry and Airpower in the Vietnam War*. Fort Leavenworth, KS: Combat Studies Institute Press, 2006.

Hussey, Ann Krueger. "Air Force Flight Screening: Evolutionary Changes 1917-2003." Office of History and Research Headquarters Air Education and Training Command Randolph AFB, TX, December 2004.

Jeffords, Susan. *The Remasculinization of America: Gender and the Vietnam War*. Theories of contemporary culture v. 10. Bloomington: Indiana University Press, 1989.

Jeter, Maj Paul E. "What Do Special Instructions Bring to the Rules of Engagements? Chaos or Clarity." *The Air Force Law Review* 55 (2004): 377-411.

Jonas, Dick. *RBAAB: The Red-Blooded All-American Boy*. Ft. Mojave, AZ: Erosonic, 1997.

Jones, Edgar. ""LMF": The Use of Psychiatric Stigma in the Royal Air Force during the Second World War." *The Journal of Military History* 70, no. 2 (April 2006): 439-458.

Kafer, Capt John H. "Relationship of Airline Pilot Demand and Air Force Pilot Retention." Wright Patterson AFB, OH: Air Force Institute of Technology, 1988.

Kanter, Arnold. "The Career Patterns of Air Force Generals." *American Journal of Political Science* 21, no. 2 (May 1977): 353-379.

Kellett, Anthony. *Combat Motivation: The Behavior of Soldiers in Battle*. International Series in Management Science/Operations Research. Boston: Kluwer-Nijhoff Pub, 1982.

Khong, Yuen Foong. *Analogies at War: Korea, Munich, Dien Bien Phu, and the Vietnam Decisions of 1965*. Princeton, N.J: Princeton University Press, 1992.

Kindsvatter, Peter S. *American Soldiers: Ground Combat in the World Wars, Korea, and Vietnam*. Modern War Studies. Lawrence KS: University Press of Kansas, 2003.

King, Henry. *Twelve O'Clock High*. DVD, 1949.

Kinnard, Douglas. *The Certain Trumpet: Maxwell Taylor & the American Experience in Vietnam*. Washington: Brassey's, 1991.

———. *The War Managers*. Annapolis, MD: Naval Institute Press, 2007.

Kitfield, James. *Prodigal Soldiers: How the Generation of Officers Born of Vietnam Revolutionized the American Style of War*. Brassey's paperback ed. An AUSA Institute of Land Warfare book. Washington, [DC]: Brassey's, 1997.

Kolko, Gabriel. *Anatomy of a War: Vietnam, the United States, and the Modern Historical Experience*. New York: New Press, 1994.

Krepinevich, Andrew F. *The Army and Vietnam*. Baltimore: Johns Hopkins University Press, 1986.

Lake, Jon, and Mark Styling. *B-52 Stratofortress Units in Combat 1955-73*. Westminster, MD: Osprey, 2004.

LaPointe, Robert L. *All for One: The Rescue of Boxer 22: The Largest Successful Search and Rescue Mission by the USAF in the Vietnam War*. Anchorage, AK: Northern PJ Press, 2002.

———. *PJs in Vietnam: The Story of Airrescue in Vietnam as Seen Through the Eyes of Pararescuemen*. Anchorage, AK: Northern PJ Press, 2001.

Lavalle, A. J. C, ed. *The Tale of Two Bridges and the Battle for the Skies Over North Vietnam*. USAF Southeast Asia monograph series. Washington: Dept. of the Air Force, 1976.

Lembcke, Jerry. *The Spitting Image: Myth, Memory, and the Legacy of Vietnam*. New York: New York University Press, 1998.

Leonard, Raymond W. "Learning from History: Linebacker II and U.S. Air Force Doctrine." *The Journal of Military History* 58, no. 2 (April 1994): 267-303.

Levy, David W. *The Debate Over Vietnam*. 2nd ed. The American moment. Baltimore: Johns Hopkins University Press, 1995.

Lewy, Guenter. *America in Vietnam*. New York: Oxford University Press, 1978.

Little, Donald D., and Barry L. Spink. "USAF Personnel Rotation in Southeast Asia (A Chronology) 1961 through 1968," April 2008. Air Force Historical Research Agency, Maxwell AFB, AL.

Llinares, Rick, and Chuck Lloyd. *Warfighters: The Story of the USAF Weapons School & the 57th Wing*. Schiffer military/aviation history. Atglen, PA: Schiffer Pub, 1996.

Luckett, Perry D. *Tempered Steel: The Three Wars of Triple Air Force Cross Winner Jim Kasler*. Dulles, VA: Potomac Books, 2005.

Lynn, John A. *Battle: A History of Combat and Culture*. Boulder: Westview Press, 2003.

———. *The Bayonets of the Republic: Motivation and Tactics in the Army of Revolutionary France, 1791-94*. Urbana: University of Illinois Press, 1984.

Marshall, S. L. A. *Men Against Fire; the Problem of Battle Command in Future War*. Washington DC: Infantry Journal, 1947.

Mason, Herbert Molloy. *The New Tigers*. New York: D. McKay Co, 1967.

McFarland, Stephen L., and Wesley P. Newton. *To Command the Sky: The Battle for Air Superiority Over Germany, 1942-1944*. Washington DC: Smithsonian Institution Press, 1991.

McMaster, H. R. *Dereliction of Duty: Lyndon Johnson, Robert McNamara, the Joint Chiefs of Staff, and the Lies That Led to Vietnam*. New York: HarperCollins, 1997.

McPherson, James M. *For Cause and Comrades: Why Men Fought in the Civil War*. New York: Oxford University Press, 1997.

Michel, Marshall L. *Clashes: Air Combat Over North Vietnam, 1965-1972*. Annapolis, MD: Naval Institute Press, 1997.

———. *The Eleven Days of Christmas: America's Last Vietnam Battle*. San Francisco, CA: Encounter Books, 2002.

"Military Aviation Movie List." http://www.coastcomp.com/av/fltline2/avmovie.htm.

Momyer, William W. *Airpower in Three Wars*. Edited by Lt Col A. J. C. Lavalle. Washington DC: Department of the Air Force, 1978.

Moran, Charles McMoran Wilson. *The Anatomy of Courage: The Classic WWI Account of the Psychological Effects of War*. London: Constable, 1945.

Moyar, Mark. *Triumph Forsaken: The Vietnam War, 1954-1965*. Cambridge: Cambridge University Press, 2006.

Mrozek, Donald J. *Air Power and the Ground War in Vietnam*. Washington DC: Pergamon-Brassey's International Defense Publishers, 1989.

Nederveen, Captain Gilles Van. *Sparks Over Vietnam: The EB-66 and the Early Struggle of Tactical Electronic Warfare*. Airpower Research Institute, 2000. https://research.maxwell.af.mil/papers/ay2000/ari/2000-03.pdf.

Nichols, John B. *On Yankee Station: The Naval Air War Over Vietnam*. Annapolis, Md: Naval Institute Press, 1987.

Pape, Robert Anthony. *Bombing to Win: Air Power and Coercion in War*. Cornell Studies in Security Affairs. Ithaca, N.Y: Cornell University Press, 1996.

Peterson, Michael E. *The Combined Action Platoons: The U.S. Marines' Other War in Vietnam*. New York: Praeger, 1989.

du Picq, Charles Ardant. *Battle Studies: Ancient and Modern Battle*. Translated by John Nesmith Greely and Robert Christie Cotton. New York: The Macmillan Company, 1921.

Pike, Douglas Eugene. *PAVN: People's Army of Vietnam*. London: Brassey's, 1986.

———. *The Viet-Cong Strategy of Terror*. Cambridge, Mass: M.I.T. Press, 1970.

Platt, Suzy. *Respectfully Quoted: A Dictionary of Quotations*. Barnes & NoblePublishing, 1993.

Plunkett, Howard W. "Ozark Lead is out of the Aircraft." *Air Power History* 52, no. 1 (Spring 2005): 4.

———. "Radar Bombing during Rolling Thunder-Part I: Ryan's Raiders." *Air Power History* 53, no. 1 (Spring 2006): 4.

———. "Radar Bombing during Rolling Thunder-Part II: Combat Lancer and Commando Club." *Air Power History* 53, no. 2 (Summer 2006): 4.

Pribbenow, Merle L. "The -Ology War: Technology and Ideology in the Vietnamese Defense of Hanoi, 1967." *The Journal of Military History* 67, no. 1 (January 2003): 175-200.

Race, Jeffrey. *War Comes to Long An; Revolutionary Conflict in a Vietnamese Province*. Berkeley: University of California Press, 1972.

Randolph, Stephen P. *Powerful and Brutal Weapons: Nixon, Kissinger, and the Easter Offensive*. Cambridge, Mass: Harvard University Press, 2007.

Reardon, Carol. *Launch the Intruders: A Naval Attack Squadron in the Vietnam War, 1972*. Modern war studies. KS: University Press of Kansas, 2005.

Reitano, Richard. "LBJ Goes To War." *Magazine of History* 18, no. 5 (October 2004): 27.

Robbins, Christopher. *The Ravens: The Men Who Flew in America's Secret War in Laos*. New York: Crown, 1987.

Samuel, Wolfgang W. E. *Glory Days: The Untold Story of the Men Who Flew the B-66 Destroyer into the Face of Fear*. Atglen, PA: Schiffer Pub, 2008.

Scales, Robert H. *Firepower in Limited War*. Washington, DC: National Defense University Press, 1990.

Schneider, Donald K. *Air Force Heroes in Vietnam*. USAF Southeast Asia Monograph Series. Maxwell Air Force Base, AL: Air University Press, 1979.

Scott, Ridley. *Black Hawk Down*. DVD. Sony Pictures, 2002.

Scutts, Jerry. *Wolfpack: Hunting MiGs Over Vietnam*. Osceola, WI: Motorbooks International, 1988.

"SEA SAR Database Project." *PJs in Vietnam*. http://www.pjsinnam.com/VN_History/db_home.htm.

Shaw, Robert L. *Fighter Combat: Tactics and Maneuvering*. Annapolis, MD: Naval Institute Press, 1985.

Sheehan, Neil. *A Bright Shining Lie: John Paul Vann and America in Vietnam*. New York: Random House, 1988.

———. "Attacks on North Vietnam Halt Today; Johnson Says Wider Talks Begin Nov. 6." *New York Times*, November 1, 1968.

Sherwood, John Darrell. *Afterburner: Naval Aviators and the Vietnam War*. New York: New York University Press, 2004.

———. *Fast Movers: America's Jet Pilots and the Vietnam Experience*. New York: Free Press, 2000.

———. *Officers in Flight Suits: The Story of American Air Force Fighter Pilots in the Korean War*. New York: New York University Press, 1996.

Shils, Edward A, and Morris Janowitz. “Cohesion and Disintegration in the Wehrmacht in World War II.” *The Public Opinion Quarterly* Vol. 12, no. No. 2 (Summer 1948): 280-315.

Spick, Mike. *The Ace Factor: Air Combat and the Role of Situational Awareness*. Annapolis, MD: Naval Inst Pr, 1988.

Stewart, Nora Kinzer. *Mates and Muchachos: Unit Cohesion in the Falklands/Malvinas War*. Washington: Brassey’s Inc, 1991.

Summers, Harry G. *On Strategy: A Critical Analysis of the Vietnam War*. Novato, CA: Presidio Press, 1982.

Teixeira, Leonard, Lt Col USAF. “Linebacker II: A Stretegic and Tactical Case Study.” Maxwell Air Force Base, Ala, April 1990.

The Whirlwind War: The United States Army in Operations Desert Shield and Desert Storm. CMH pub 70-30. Washington, DC: Center of Military History, United States Army, 1994.

Thompson, William Dennison. *Cessna, Wings for the World II*. Bend, OR: Maverick Publications, 1995.

Turner Publishing Co. *Red River Valley Fighter Pilots*. Paducah, KY: Turner Publishing Co, 2000.

Wamsley, Gary L. “Contrasting Institutions of Air Force Socialization: Happenstance or Bellwether?.” *The American Journal of Sociology* 78, no. 2 (September 1972): 399-417.

Watson, Alex. “Self-Deception and Survival: Mental Coping Strategies on the Western Front, 1914-18.” *Journal of Contemporary History* 41, no. 2 (April 2006): 247-268.

Weigley, Russell Frank. *The American Way of War; A History of United States Military Strategy and Policy*. New York: Macmillan, 1973.

Wells, Mark K. *Courage and Air Warfare: The Allied Aircrew Experience in the Second World War*. London: Frank Cass, 1995.

Whitcomb, Darrel. “Tonnage and Technology: Air power on the Ho Chi Minh Trail.” *Air Power History* 44, no. 1 (Spring 1997): 4.

Whitcomb, Darrel D. *The Rescue of Bat 21*. Annapolis, MD: Naval Institute Press, 1998.

Wilcox, Robert K. *Scream of Eagles: The Creation of Top Gun and the U.S. Air Victory in Vietnam*. New York: J. Wiley, 1990.

Wohl, Robert. *A Passion for Wings: Aviation and the Western Imagination, 1908-1918*. New Haven: Yale University Press, 1996.

———. *The Spectacle of Flight: Aviation and the Western Imagination, 1920-1950*. New Haven: Yale University Press, 2005.

Worden, R. Michael. *Rise of the Fighter Generals: The Problem of Air Force Leadership, 1945-1982*. Maxwell Air Force Base, AL: Air University Press, 1998.

Zentner, Lt Col John J. *The Art of Wing Leadership and Aircrew Morale in Combat*. CADRE Paper 11. Maxwell Air Force Base, AL: Air University Press, 2001.

CURRICULUM VITAE

William F. Andrews, Colonel USAF (retired), has served on the faculty at National Defense University from 2004 to the present, where he teaches courses on national security strategy and the human dimensions of war. He is an Air Force Command Pilot, and commanded combat flying units at the squadron and group level, including command of Al Udeid Air Base, Qatar during the war against Afghanistan. His combat experience includes fighter missions over Iraq in Operations Desert Storm and Southern Watch, and Afghanistan in Operation Enduring Freedom. He was a prisoner of war in the closing days of Desert Strom after ejecting from a battle damaged F-16. He received his commission in May 1980 upon graduating from the United States Air Force Academy with a Bachelor of Science Degree in History. He earned Masters Degrees from the University of Alabama (MA History), the School of Advanced Airpower Studies (Master of Airpower Art and Science), and the Industrial College of the Armed Forces (MS National Resource Strategy). He is married to the former Stacey Williams of Daytona Beach FL. They have three children: Sean (USAF Academy class of 2007), Shannon (Virginia Commonwealth University class of 2010), and Patrick (Bishop Denis J. O'Connell High School class of 2012) . The author invites comments on this dissertation at billandrews@member.afa.org.