

AIR POWER VERSUS A FIELDDED FORCE

The Misty Facs Of Vietnam And The A-10 Facs Of Kosovo

A COMPARATIVE ANALYSIS

BY

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A THESIS PRESENTED TO THE FACULTY OF
THE SCHOOL OF ADVANCED AIRPOWER STUDIES
FOR COMPLETION OF GRADUATE REQUIREMENTS

SCHOOL OF ADVANCED AIRPOWER STUDIES

AIR UNIVERSITY

MAXWELL AIR FORCE BASE, ALABAMA

JUNE 2002

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Report Documentation Page			Form Approved OMB No. 0704-0188		
Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.					
1. REPORT DATE 00 JUN 2002		2. REPORT TYPE N/A		3. DATES COVERED -	
4. TITLE AND SUBTITLE Air Power Versus A Fielded Force The Misty Facs Of Vietnam And The A-10 Facs Of Kosovo A Comparative Analysis				5a. CONTRACT NUMBER	
				5b. GRANT NUMBER	
				5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S)				5d. PROJECT NUMBER	
				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Air University Maxwell Air Force Base, Alabama				8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)				10. SPONSOR/MONITOR'S ACRONYM(S)	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release, distribution unlimited					
13. SUPPLEMENTARY NOTES The original document contains color images.					
14. ABSTRACT					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT UU	18. NUMBER OF PAGES 147	19a. NAME OF RESPONSIBLE PERSON
a. REPORT unclassified	b. ABSTRACT unclassified	c. THIS PAGE unclassified			

DISCLAIMER

The conclusions and opinions expressed in this document are those of the author. They do not reflect the official position of the U.S. Government, Department of Defense, the United States Air Force, or Air University.

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ACKNOWLEDGMENTS

The genesis of this project is my combat experience as the Weapons Officer of the 81st Fighter Squadron, conducting A-10 FAC operations over Kosovo. My gratitude goes to the enlisted maintainers, ammo troops, and operations personnel who worked long hours and endured separation from family and friends to ensure the jets were always combat ready. I also extend my thanks to the 81st Fighter Squadron Commander, Colonel Chris Haave, whose leadership and wisdom was an inspiration to the squadron. His inputs were particularly valuable in capturing the history and tactics of the A-10 FACs mission. Finally, my thanks goes out to the A-10 pilots who risked AAA and SAMs on a daily basis to accomplish the most difficult task of attacking enemy ground forces from the air.

I would like to express my admiration for the Misty FACs, whose heroics over the deadly skies of North Vietnam and Laos have inspired three decades of aviators. Without their willingness to share their experiences, this project would not have been possible. I am particularly thankful to Major General, ret., Don Shepperd for his help and inputs to improve this work.

Special thanks go to my faculty research advisor, James Corum. His encouragement and experience proved fundamental in organizing and focusing this research. I also express my appreciation to my reader, Richard Andres, whose insightful comments kept me constantly thinking and revising my ideas.

Last, but most importantly, I would like to extend a word of thanks to my wife and partner Bonnie who, as my chief editor, has lended readability to my otherwise convoluted thoughts and who endured our separation during Allied Force as a true champion.

ABSTRACT

Since World War II, the U.S. has been involved in several limited conflicts, against smaller, far less militarily capable opponents. Unlimited war with the Soviet Union, for which the USAF prepared over 40 years, never materialized. Instead, U.S. airpower has generally been directed against underdeveloped, authoritarian states. Such regimes tend to rely upon their armies as their primary source of power. Yet the USAF, born out of the aerial combat experience of World War II, has firmly held to airpower as the means of bypassing military forces and striking directly at the vital center of the enemy. Thus, American airmen are predisposed to discounting the effectiveness of air attack against fielded forces. The realities of modern conflict, however, have dictated the need for direct attack on armies. Tactics have been improvised by airmen with little previous training or doctrine in order to use the equipment at hand to get the job done. This study examines two such groups of airmen the Misty FACs of Vietnam from 1967-70 and the A-10 FACs over Kosovo in 1999.

A comparison of the Misty and A-10 FAC missions clearly demonstrates a failure of the USAF to develop a full range of suitable tactics for the direct attack of enemy fielded forces. Although the quantum leaps in weapons delivery accuracy from Vietnam to Kosovo now make it possible to destroy armor and artillery from the air, there has not been a corresponding improvement in target identification. Until the USAF prioritizes the direct attack of ground forces and target identification, its ability to effectively attack fielded forces will remain limited. Drawing from the lessons of the Misty and A-10 FACs, the recommendations presented here focus on equipment, tactics and training, and doctrine. However, airmen should understand that

there is no silver bullet for the challenge of target identification. No single piece of equipment or advance in technology will solve the problem. Airmen must first develop the proper doctrine and tactics, then take their equipment and train as realistically as possible. Only then can the USAF reach its potential for defeating an enemy army in the field.

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Chapter 1

INTRODUCTION

The limited conflicts in which the United States military has been involved since World War II have pitted the U.S. against smaller, less sophisticated opponents with far less capable air forces. Though often politically constrained, the United States Air Force has in most cases achieved air superiority and then directed its firepower against key enemy targets. It has been in targeting that the USAF has faced its greatest challenge: in turning the advantage won in the air into military and political victory on the ground. Particularly frustrating for the USAF has been the nature of its opponents. Underdeveloped, authoritarian states with power based on military might have proven more difficult to target than large, industrial nations reliant on economic strength. Airmen have long voiced their belief in the fundamental advantage of airpower in bypassing military forces and striking directly into the vital center of the enemy. Yet since World War II, the USAF has been forced to attack the very battlefield it was created to avoid. Though airmen initially found themselves ill prepared for the task, the crucible of combat soon forced them to develop new methods for striking the enemy's fielded forces.

The techniques crafted with blood and sweat in Korea and Vietnam, however, were deemed irrelevant. Such tactics were considered as outmoded as the U.S. prepared for the total nuclear war envisioned during the Cold War. The post Cold War USAF then de-emphasized its nuclear strike capability, turning instead to stealth and precision to deliver surgical conventional strategic attacks. Given this proclivity for strategic attack,

one must ask if the USAF has failed to develop suitable tactics for the direct attack of enemy fielded forces.

Background of Fast FACs

This question is best addressed by comparing the tactics used in two cases in which U.S. airpower was called upon to attack enemy forces independent of friendly ground troops. In the Vietnam War, Air Force O-1 and O-2 Forward Air Controllers (FACs) began flying visual reconnaissance missions over the southern area of North Vietnam. In response, the North Vietnamese deployed additional air defenses. As the threat in these areas became too high for these slow and vulnerable propeller-driven aircraft, new tactics had to be developed. Operation Commando Sabre was the first test of the “Fast FAC” concept. Jet aircraft were to perform FAC duties, adapting the two-seat version of the F-100 Super Sabre to the visual reconnaissance and strike control mission. Under the call sign of “Misty”, the F-100F crews became widely known as “Misty FACs”, and set about the task of interdicting equipment and supplies flowing into South Vietnam. Commando Sabre operations never consisted of more than 22 pilots at any one time and rarely involved more than 6 single-ship missions per day. Yet they succeeded in locating and controlling strikes on targets where other methods had failed. This led not only to the continuation of the program, but also to the expansion of the Fast FAC mission to the F-4 Phantom. Success came at a price, though, as the low altitude Misty FAC missions proved to be some of the most dangerous flown in the Vietnam War. This case study examines the tactics developed by the Misty FACs for locating and

attacking the North Vietnamese in the face of the constant threat of anti-aircraft artillery (AAA).

The second case involves the more recent use of USAF airpower during Operation Allied Force in 1999. In the absence of friendly ground forces, A-10 FACs commanded forty-ship strike packages in the direct attack of the Serbian 3rd Army in Kosovo. Supported by Suppression of Enemy Air Defenses (SEAD) and air-to-air fighters, A-10 FACs operated overhead radar-guided SA-6 surface-to-air missiles and Serbian MiG-21 fighter bases. A-10 FACs were given the daunting task of locating, identifying, and attacking Serbian armor while simultaneously minimizing collateral damage. Target identification was particularly difficult, given the steps taken by the Serbian army towards concealment and deception, and the potential for collateral damage was enormous, as nearly a million ethnic Albanian refugees streamed toward the Albanian and Macedonian borders. The large number of AAA and man-portable surface-to-air missiles (MANPADS) dictated Rules Of Engagement (ROE) which restricted operations at low altitude and forced A-10 FACs to develop tactics for medium altitude visual reconnaissance.

A-10 FAC expertise resided within a small cadre of some 30 FAC-qualified pilots who flew most of the FAC missions over Kosovo. These pilots improvised tactics for the real time use of Intelligence, Surveillance, and Reconnaissance (ISR) assets to include Joint Surveillance Target Attack Radar System (JSTARS) and Predator Unmanned Aerial Vehicles (UAV). Heavily loaded with general purpose bombs, air-to-surface missiles, and rockets, A-10 FACs struck and marked targets for NATO aircraft from ten different

nations. These FACs proved to be NATO's most effective use of airpower against Serbian forces deployed in Kosovo.¹

Attacking Fielded Forces

Before examining these two case studies in depth, however, the relevance of aerial attack on fielded forces needs to be addressed.² Some USAF strategic airpower theorists have argued that targeting fielded forces is of marginal importance.³ Yet such theorists fail to recognize that, since World War II, U.S. airpower has been directed primarily against underdeveloped, authoritarian states rather than modern, industrialized states. Such states are usually controlled by leaders who rely on the backing of the military as a primary source of their power. The U.S. has enjoyed the advantage of air superiority over these small states, which have not been able to afford a modern, sophisticated air force.⁴ They rely, instead, upon their conventional armies, ranging from large armored divisions to small groups of lightly-armed militia, to provide both external and internal security. Airpower's ability to attack such armies is a significant contribution to the defeat of these states. The U.S. war in Afghanistan provides an excellent example of the successful use of airpower against Taliban ground forces and its decisive role in the swift overthrow of that regime.

¹ Christopher Haave and Phil Haun, *A-10s over Kosovo*, (Maxwell Air Base, Alabama: Air University Press, 2002), 303.

² Air Force Doctrine Document (AFDD) 2-1.3 *Counterland* of 27 August, 1999. Current Air Force doctrine limits the USAF definition of Air Force Counterland missions, Interdiction and Close Air Support to how these missions relate to friendly ground forces. AFDD 2-1.3 *Counterland* of 27 August, 1999.

³ Colonel John A. Warden III, *The Enemy as a System*, *Airpower Journal*, Spring 1995, 52.

⁴ Enemy states, however, have had sophisticated air defense weapons and integrated air defense systems (IADS).

Skeptics have argued that armies are relatively invulnerable to attack from the air.⁵ However, advances in technology have greatly improved the strike capability of air forces against mobile armies. Improvements in ISR capabilities, such as UAVs, have aided enormously in locating and identifying valid targets. Precision-guided munitions such as air-to-surface missiles and Global Positioning System (GPS) and laser-guided bombs can be delivered from medium altitude and have provided a quantum leap in the ability of airpower to kill individual armored vehicles and artillery pieces. Finally, the survivability of strike aircraft has likewise improved. Electronic counter measures, coupled with SEAD coverage and jamming assets allow U.S. fighters to operate above the single-digit radar SAMs of most rogue states.⁶

The ability to effectively attack an enemy ground force from the air can be of considerable importance when it leads to the achievement of military and political objectives with minimal exposure of U.S. and allied ground forces to risk. The goal of any commander should be to achieve the objectives given to him with the minimum risk to his own forces. Airpower provides a powerful weapon in this process if wielded by trained and experienced warriors. Even if the attack of fielded forces is not considered the most efficient use of airpower by most contemporary airpower theorists, the fact remains that airpower has been used in just such a capacity in every U.S. war from World War I to Afghanistan. Even if USAF leaders are reluctant to employ airpower in this manner, it seems that circumstances will compel them to do so, making tactics for such an eventuality a task to be mastered and maintained.

⁵ Warden, 54.

⁶ Single-digit SAMs include radar-guided SA-2s, 3s, 6s, and 8s. This is opposed to more modern SA-10s and SA-12s, double-digit SAMs which are currently limited in availability outside the former USSR states.

It should be recognized, however, that the direct attack of mobile fielded forces is a fundamentally different mission from the more traditional airpower roles of strategic attack and air interdiction against fixed targets. While many of the skills and techniques required for Close Air Support (CAS) are needed, the fact that target identification is not provided by friendly ground forces changes the very nature of the mission. In addition to threat avoidance and accurate weapons delivery, aircrews must be trained in target acquisition. This will continue to pose the most difficult challenge to direct aerial attack.

Scope of Research

The difficulties of Misty FAC and A-10 FAC operations are addressed in this study by the following questions: What was the contextual situation in Vietnam and Kosovo that warranted the use of Fast FACs in operations independent of friendly ground forces? What were the tactics that the Misty and A-10 FACs developed to locate, identify, attack, and assess the enemy? What were the advantages and disadvantages of the F-100F and A-10 airframes for FAC operations? What ISR assets did Misty and A-10 FACs have available for operations and how did the pilots compensate for any shortfalls? What weapons capabilities and limitations did Misty and A-10 FACs have for striking and destroying targets? What were the threats and how were they dealt with? How did the Rules Of Engagement (ROE) affect operations? What was a typical mission profile? How was Battle Damage Assessment (BDA) collected and incorporated into the intelligence system? What weaponeering issues were found to be the most challenging? What were the training and manning requirements of the mission? What were the qualities of a good FAC? How did nighttime affect operations? How did Misty and A-

10 FACs contribute to Combat Search and Rescue (CSAR) missions? What occurred between Vietnam and Kosovo that caused the de-emphasis of the Fast FAC mission? What lessons applied to both theaters and remain relevant today? What steps should the U.S. Air Force take to rectify weaknesses in operations against fielded forces?

Methodology

This research focuses on how the Misty and A-10 FACs developed tactics to more effectively attack enemy ground forces from the air. It also considers whether the lessons garnered at the precious price of blood and treasure in Vietnam were lost on the next generation of tacticians as they prepared for combat. While this research addresses many of the issues arising from such a complex mission, it leaves two main questions unanswered. First, what emphasis should the direct attack of fielded forces be given with respect to strategic attack? In response, I assume that the attack of fielded forces is important. Political conditions have repeatedly required attacking fielded forces. Second, what is the most effective use of airpower against ground forces, independently or supporting friendly ground forces? This study does not intend to argue the merits of joint warfare. Political restrictions prevented the use of friendly ground forces in North Vietnam and Kosovo, forcing airpower to go it alone.⁷ In other cases, as in the Gulf War, airpower may be called upon to prepare the battlefield in advance of a ground invasion. Either way, airpower must be prepared to operate in an independent manner against an enemy's army.

⁷ In the case of the Misty FACs, the fear of retaliation from China and the Soviet Union prevented friendly ground forces from threatening an invasion of North Vietnam. In the case of the A-10 FACs, President Clinton announced prior to the commencement of hostilities that ground troops would not be used.

Sources

In comparing the Misty FAC and A-10 FAC operations, primary source documents have been used to the greatest extent possible. For Misty FAC operations, three major collections have been reviewed. The USAF Historical Research Agency has a wealth of recently declassified documents on Vietnam, including oral histories, various U.S. Pacific Air Forces (PACAF) CHECO studies on air operations of the Vietnam War, and particularly valuable 37th and 31st Fighter Wing and Commando Sabre Operation histories.⁸ A new book, *Misty: The First Person Stories of the F-100 Misty Fast FACs in the Vietnam War*, contains the personal combat experiences of the pilots, providing not only the tactics employed, but also insights into the overall effectiveness of Misty operations and the Vietnam War.⁹ Finally, a questionnaire was sent to the surviving Misty FACs, which focused on the suitability of the F-100F for Fast FAC operations and the tactics developed for visual reconnaissance, strike control, and threat avoidance. Though this survey was conducted over 30 years after the fact, the responses underscore many of the primary challenges of the Fast FAC mission.¹⁰

⁸ CHECO was the codename for a large number of classified studies conducted by PACAF on air operations in Vietnam.

⁹ Don Shepperd (ed.), *Misty: The First Person Stories of the F-100 Misty Fast FACs in the Vietnam War*, (Austin, Texas: The Misty FAC Foundation), 2000.

¹⁰ 120 of the 155 Misty FAC pilots were alive at the time of this research, of which 40 responded to the questionnaire. The following questions were asked of them: Describe the strengths and weaknesses of the F-100F in performing the FAC role (include both visual reconnaissance and air strike control). What was the typical combat load for a standard day FAC mission? What considerations drove these load-outs? How did this load-out change for night operations? Describe your tactics for visual reconnaissance for a typical target. Describe your tactics for controlling strikers onto a typical target. Describe your tactics for marking a target (rockets, talk-on, flare, gun). Describe a typical mission (mission duration, number of tankers, time in target area, time spent in visual reconnaissance, a typical air strike control, etc.). What were the primary methods for avoiding the threat (altitude, jinking, single passes, etc.)? Describe how you executed each maneuver. Which threats were the greatest concern to you and how did you counter them? Describe the upgrade program you underwent to qualify as a Misty FAC (include any prerequisites such as time/sorties in country, flight lead, volunteer, etc.). How well prepared/trained did you feel for conducting

For A-10 FAC operations, much has been drawn from the forthcoming book by Air University Press, *A-10s over Kosovo*. Written by the pilots who flew the missions over Kosovo, this book provides first-hand experiences of fighting the Serbian 3rd Army from the air. Other personal experiences are provided from war diaries and interviews with A-10 FACs, along with the results of a questionnaire conducted by the 81st Fighter Squadron at the end of Operation Allied Force in late June of 1999.

A comparison between the Misty FACs of Vietnam and the A-10 FACs of Kosovo can yield 4 major contributions to our understanding of air war doctrine. First, airpower has been called upon to attack enemy armies since the advent of the airplane. These two case studies demonstrate the relevance and challenge of targeting ground forces from the air without the aid of friendly ground forces. Second, these two cases, separated by both time and space, provide fascinating insights into the ability of airmen to innovate in the face of an intelligent and ever-adapting enemy. Likewise, the courage and airmanship of those who flew these missions reveal the human dimension of combat that is so often forgotten in discussions of modern airpower. It is the warrior spirit that proves itself on the field of battle, not technology. Third, improvements in weapons employment from Vietnam to Kosovo have not been matched by similar strides in target identification. Locating the target remains the most challenging task for airmen today. Fourth, shortfalls in USAF equipment, training, and doctrine are identified and remedies proposed. Confession is the first step towards recovery. Only with the recognition of its failures can improvements to USAF operations be forthcoming.

Misty FAC operations? Did previous Close Air Support experience sufficiently prepare you for the Misty FAC role? How effective did you believe Misty FAC operations were at conducting interdiction

Chapter 2

HISTORY OF AIR INTERDICTION FROM WORLD WAR I THROUGH VIETNAM

Since the days of biplanes, one of airpower's most sought after applications has been its potential to engage enemy ground forces. Today, such counterland operations are classified into two missions: Close Air Support (CAS) and Air Interdiction (AI).¹¹ Whereas CAS deals specifically with air operations in the close proximity of friendly ground troops and requires detailed coordination, AI engages the enemy before it reaches the battlefield. Per current USAF doctrine, AI is employed "...to destroy, disrupt, divert, or delay the enemy's surface military potential before it can be used effectively against friendly forces."¹² History is replete with battles decided by forces that did not arrive in time to fight. In the 20th century, air interdiction has greatly hindered the movement of men, weapons, and supplies for those armies who have lost the vertical battle for air superiority. This chapter discusses the attributes of successful interdiction campaigns and briefly traces the history of U.S. air interdiction from its inception through the Vietnam War. It then outlines the importance of interdiction in the overall campaign strategy in Vietnam and the role that Misty FACs played in that campaign. Finally, this chapter highlights the three-year history of the Misty FACs from their beginning in the spring of 1967 to their final flight in May of 1970.

operations? What were the primary limitations to more successful operations?

¹¹ Air Force Doctrine Document (AFDD)2-1.3, *Counterland*, 27 August, 1999, v.

¹² Air Force Doctrine Document (AFDD) 1, *Air Force Basic Doctrine*, September, 1997, 50.

There are five key components of successful air interdiction operations. First, as with most air operations, air superiority is a prerequisite. The ability to operate unhampered in a reduced threat environment greatly increases airpower's ability to identify, attack, and assess targets. Air superiority requires the suppression of both enemy aircraft and surface-to-air threats. Second, the ability to identify targets is paramount. Weather, terrain and vegetation, and enemy nighttime movement combine to degrade the ability to identify valid targets from the air. Intelligence and various on- and off-board sensors have, to varying degrees, aided airmen in acquiring targets. Still, target identification remains the most limiting factor in air operations. Third, air interdiction must be a sustained operation. To be successful, the flow of supplies must be slowed to the point where it restricts the enemy's ability to attack or defend. Persistence and continual pressure is required. Fourth, the characteristics of enemy lines of communication (LOC) have considerable bearing on the overall affect of an interdiction campaign. The length of LOCs, the presence of enemy choke points, and the concentration of supplies determine the availability of lucrative targets.¹³ Finally, the enemy's rate of consumption of supplies and the level of existing stockpiles have a great deal to do with the effectiveness of air interdiction. An enemy in heavy combat and generating a high rate of consumption with limited reserves is rendered more vulnerable to interdiction.¹⁴

Air Interdiction From World War I to the Korean War

Aviation was initially used for observation and artillery spotting in direct support of ground operations in World War I. Soon, however, airmen began mounting machine

¹³ Eduard Mark, *Aerial Interdiction: airpower and the land battle in three American wars: a historical analysis*, (Washington: Office of Air Force History, 1994), 5.

guns and loading bombs on to their aircraft and new missions emerged, including air interdiction.¹⁵ Early in the war French and British air forces began to target German trains, railroads, and depots in an effort to decrease the flow of supplies to the front.¹⁶ The reliance of the Germans on rail transportation and the relative ease with which airmen could identify these targets made them susceptible to attack. Even with the formation of the Royal Air Force (RAF) for the express purpose of targeting German industry, transportation was ranked only behind chemical and steel works on the target priority list for the heavy bombers of the RAF Independent Forces.¹⁷ Although British bombers that failed to locate their industrial targets (which was often) often bombed interdiction targets of opportunity, the RAF never applied a concentrated effort to reduce the flow of men, equipment, and supplies to the German trenches.¹⁸

Operation Overlord, the Allied invasion of France at Normandy, illustrates not only the maturation of airpower from WWI to WWII, but also the importance of air interdiction in the outcome of the land battle. The Allies had learned many lessons on the application of airpower from their campaigns in North Africa and Italy.¹⁹ By Normandy, the importance of air superiority was well understood and the destruction of the Luftwaffe by the armada of B-17s and P-51s of the 8th Air Force and P-47s of the 9th Air Force prepared the way for the ensuing ground invasion.²⁰ With air superiority achieved,

¹⁴ Ibid., 402.

¹⁵ Benjamin Cooling, *Case Studies in the Achievement of Air Superiority*, (Washington: Air Force History and Museums Program, 1994), 3.

¹⁶ Mark, 9.

¹⁷ George Williams, *Biplanes and Bombsights: British Bombing in World War I*, (Maxwell AFB, Ala: Air University Press, 1999), 178.

¹⁸ John Buckley, *Air Power in the Age of Total War*, (Bloomington, Ind: Indiana University Press, 1999), 60.

¹⁹ Alan Stephens (ed.), *The War in the Air: 1914-1994*, (Fairbairn, Australia: Air Power Studies Centre, 1994), 108.

²⁰ Buckley, 150.

the Allies focused on the interdiction of German LOCs, thus isolating German forces from reinforcement. Three months prior to D-day, U.S. and RAF bombers were redirected from strategic bombing to a sustained air interdiction operation against the German transportation system in France.²¹

As in World War I, the German army relied heavily on the French railways. French railheads were not only easily targeted by air, but also provided key choke points for the flow of German supplies. Daylight attacks on German convoys by Allied tactical air further reduced the flow of supplies. The German commander in France, Field Marshal Rundstedt, later stated that it was the air interdiction of railways and daylight convoys that prevented a successful German response to the invasion at Normandy.²² The overall success of Allied air interdiction in support of Operation Overlord can be credited to a combination of Allied air superiority, a sustained air interdiction campaign, the ease of identifying and attacking enemy lines of communication, and a German army desperately in need of resupply and reinforcement as it tried to hold back the Allied advance in France and Belgium.

However significant air operations in the victory over Germany, air interdiction was not the postwar talisman that U.S. airmen desired. It was strategic bombing that provided the justification needed for an independent Air Force, leaving the lessons of air interdiction neglected during the postwar drawdown. Such lessons would soon have to be relearned in the skies over Korea.

U.S. air interdiction in Korea began with operations against the North Korean forces attacking U.S. ground forces along the Pusan perimeter. Air support continued to

²¹ William Momyer, *Air Power in Three Wars: WWII, Korea, Vietnam, reprint*, (Washington: Office of Air Force History, 1985), 164.

be critical during the subsequent breakout of U.S. ground forces in the fast-paced march to the Yalu in autumn of 1950. Although short of airfields and tactical aircraft, U.S. airmen neutralized the Korean rail network, forcing the North Koreans to move supplies by convoy across already overextended supply lines. New U.S. F-80s and surplus World War II F-51s were employed against truck convoys by day, limiting the North Koreans to nighttime movement.²³ The North Korean Army, short of food and other essentials, lacked the moral and physical strength to repel the U.S. breakout at Pusan.²⁴

The 26 November, 1950 counterattack by over 200,000 Chinese troops across the Yalu River signaled a new stage in the Korean War.²⁵ U.S. air interdiction efforts during this phase proved less effective than previous efforts for four reasons. First, the introduction of Chinese fighter aircraft and a buildup of anti-aircraft weapons along Chinese LOCs signaled the end of unopposed U.S. air operations.²⁶ After losses of aircraft to Chinese MiGs, B-26 and B-29 daylight missions over North Korea were discontinued.²⁷ Visual reconnaissance and bombing accuracy were also affected as aircrews were forced to react to the air defenses. Second, the USAF found itself short of tactical aircraft for sustained and persistent air operations against the Red Army.²⁸ The de-emphasis of tactical aviation, along with the post-World War II reduction in forces, left the USAF short-handed in dealing with the widening scope of interdiction operations. Third, the Chinese adapted their tactics, by stepping up the use of camouflage and deception, reducing the size of their convoys, and introducing nighttime convoy

²² Ibid., 166.

²³ Mark, 271-2.

²⁴ Ibid., 281.

²⁵ Momyer, 169.

²⁶ Mark, 314.

²⁷ Max Hastings, *The Korean War*, (New York: Simon & Schuster, Inc, 1987), 265.

²⁸ Mark, 317.

operations. Finally, the stalemate of the ground war lowered the consumption rates of the Red Army, leaving it less vulnerable to air interdiction.²⁹

Overall, U.S. air interdiction operations in the Korean War produced mixed results. The USAF showed little concern over any weaknesses highlighted during the conflict, however, preferring to view the war as an aberration with little to be learned or applied toward the conduct of future air operations. This penchant for ignoring the lessons of the past found the USAF ill-prepared to conduct air interdiction in Vietnam a decade later.

Vietnam: The Interdiction Campaign

Prior to August 1964, the U.S. military presence in South Vietnam was limited to that of an advisory role. However, instability within the South Vietnamese government led President Lyndon Johnson to question Saigon's ability to withstand the increasing threat from North Vietnam.³⁰ In the wake of the Gulf of Tonkin incident of 2 August, 1964, Johnson's position shifted towards more aggressive and offensive measures, leading ultimately to the commencement of the Rolling Thunder air campaign in March of 1965.

Johnson's primary goal for Rolling Thunder was to demonstrate to Hanoi the resolve of the United States, believing that a series of graduated air strikes on North

²⁹ Ibid., 317.

³⁰ Mark Clodfelter, *The Limits of Air Power: The American Bombing of North Vietnam*, (New York: The Free Press, 1989) 40, 49. Nguyen Khanh had taken power in South Vietnam by coup on 30 January, 1964. By August, his government was itself under threat and of grave concern to U.S. President Johnson's advisors. Khanh resigned 25 February, 1965 and was replaced by Phan Huy Quat. Quat was overthrown in a coup by South Vietnamese officers on 12 June, 1965. John, Schlight, *The War in South Vietnam: The Years of the Offensive 1965-1968*, (Washington: Office of Air Force History, 1988), 16. Three noteworthy attacks by North Vietnamese regulars and the Viet Cong: Bien Hoa Air Base mortar attack in November,

Vietnam would cause Hanoi to withdraw support from the Viet Cong in South Vietnam.³¹

A secondary goal was to increase morale within Saigon and to help stabilize the South Vietnamese government. Additionally, the air strikes were to limit the flow of reinforcements, weapons, and supplies to the Viet Cong.³²

While Rolling Thunder was an offensive campaign, it fell short of the strategic air campaign envisioned by Chief of the Air Force Curtis LeMay and his Air Staff.³³ Target selection was reserved exclusively for President Johnson and was conducted during the infamous Tuesday Rose Garden luncheons. These limited air strikes alone, however, did not achieve Johnson's objectives and, by July of 1965, he concluded that victory in Vietnam would require a protracted campaign with more emphasis on military action in South Vietnam.³⁴

As the Johnson administration shifted its emphasis toward ground operations and increased U.S. troop strength, the importance of close air support and the interdiction of supplies from North Vietnam to the Viet Cong in the south was likewise elevated.³⁵ Under the direction of Military Assistance Command, Vietnam (MACV) Commander, Army General Westmoreland, the U.S. Army concentrated on direct military action in South Vietnam against Viet Cong and North Vietnamese regular forces. These ground operations, which were restricted to South Vietnam, relied heavily on close air support.³⁶

1964, The Christmas Eve bombing of Brink Hotel American barracks in Saigon , and Bien Gia battle at the end of December defeated a Vietnamese Marine battalion and two ARVN ranger companies.

³¹ Clodfelter, 60.

³² Ibid., 60.

³³ Momyer, 13. The Air Staff had proposed a strategic air campaign consisting of 94 targets in North Vietnam.

³⁴ Clodfelter, 71. Johnson accepted Secretary of Defense Robert McNamara's proposals, following a McNamara fact finding trip in July, 1965.

³⁵ Ibid., 70. Johnson increased U.S. troop strength to 82,000 in late April, 1965 and further approved in July an increase to 175,000. Schlight, 33.

³⁶ Schlight, 42.

While the Air Force provided CAS within South Vietnam, it was also responsible for conducting the Rolling Thunder strikes in the North, including interdiction missions.

The North Vietnamese logistics and transportation system was centered in Hanoi. While the rail system accommodated supplies from China by land, Haiphong received shipments from the Soviet Union by sea. These were then moved along rail and major road routes toward the South and transferred to smaller convoys, which maneuvered along a series of redundant roads and trails. The supplies were further dispersed as they approached the demilitarized zone (DMZ) and carried by truck, bicycle, or packed on foot along trails at night. The North Vietnamese also moved supplies through the Laos panhandle to more easily access Viet Cong positions in central and southern South Vietnam. Known as the Ho Chi Minh Trail, this network of thousands of miles of redundant roads concealed North Vietnamese trucks under a dense triple canopy forest.³⁷

The interdiction campaign from Hanoi to South Vietnam focused on four areas: on the Rolling Thunder air campaign in North Vietnam in Route Packages IV, V and VI, on the area in southern North Vietnam near the DMZ in route Package I, on the Ho Chi Minh Trail in southern Laos, and on trails within South Vietnam.³⁸

³⁷ Mark, 331.

³⁸ Momyer, 174.

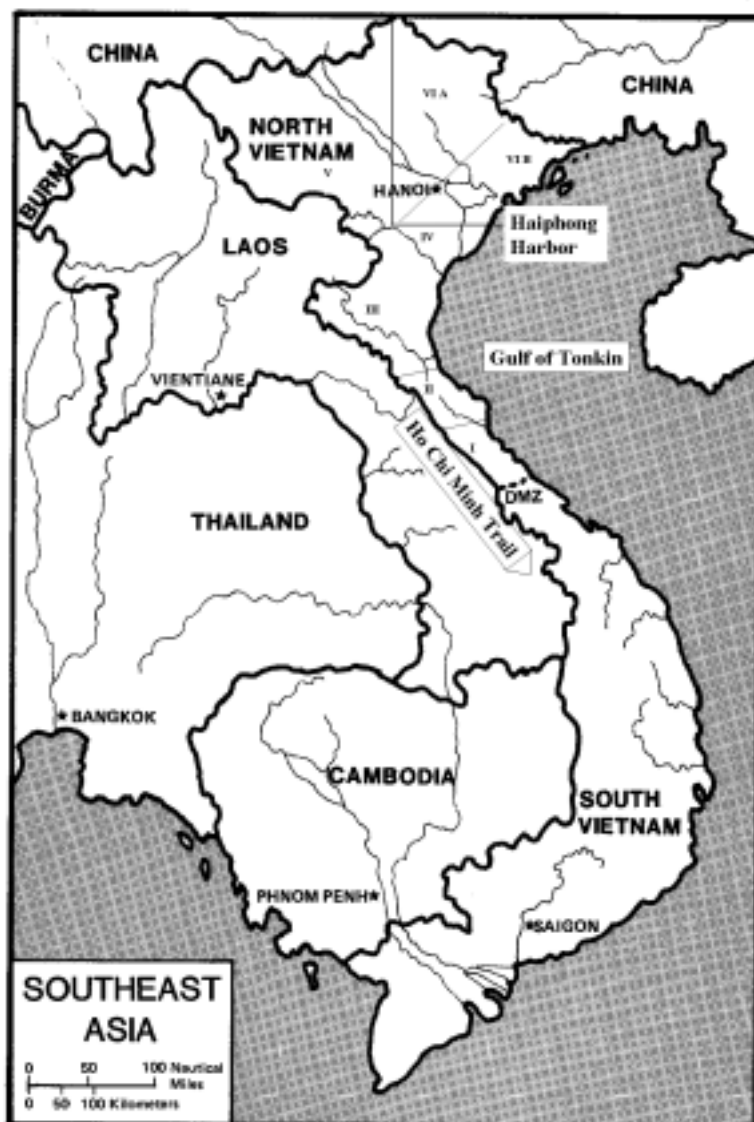


Figure 1: Southeast Asia including Route Packages and Ho Chi Minh Trail³⁹

The most lucrative targets were those found at the head of the transportation system around Hanoi.⁴⁰ These included railheads, major bridges, and repair and support facilities for the entire logistics systems. However, many of these targets were within the

³⁹ Schlight, xiv.

restricted and prohibited zones imposed by the Johnson administration around Hanoi and Haiphong Harbor and were thus off limits to attack for much of the war.⁴¹

Interdiction near the DMZ and along the Ho Chi Minh Trail proved more difficult.⁴² Bombing the roads was ineffective due to the redundancy of road systems and the relative ease with which the roads were repaired.⁴³ For interdiction to be effective, convoys had to be attacked directly. Target identification was further complicated as the North Vietnamese adapted to traveling at night and in poor weather.

The interdiction campaign in South Vietnam, Laos, and near the DMZ in North Vietnam instead relied heavily on airborne Forward Air Controllers (FACs) for target identification and strike control. Three types of aircraft were used for these missions: slow moving, propeller-driven aircraft, armed cargo aircraft, and jet fighters.

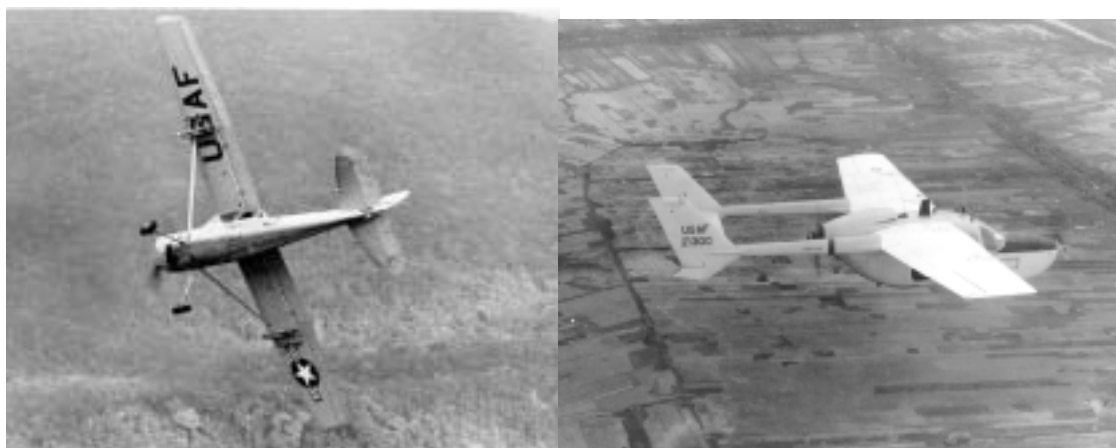


Figure 2: O-1 Bird Dog and O-2A Super Skymaster

⁴⁰ Momyer, 174.

⁴¹ Ibid., 184.

⁴² Gary Lester, *Mosquitoes to Wolves: The Evolution of the Airborne Forward Air Controller*, (Maxwell AFB, Ala: Air University Press, 1997) 151-7. Interdiction in southern Laos included operations Steel Tiger, Tiger Hound, Cricket, and Commando Hunt I-VII. Momyer, 217. Interdiction in Route Package I was known as TALLY HO.

⁴³ Mark, 335.

The 19th Tactical Air Support Squadron (TASS) began deploying 22 Cessna O-1 “Bird Dogs” and 44 FAC pilots in June of 1963 in support of the South Vietnamese Air Force.⁴⁴ By January, 1965 the number of FAC pilots in Southeast Asia had grown to 144. An additional three TASSs were activated in March and, by December, 224 FACs were in country.⁴⁵ With continued high demand for these airborne FACs their number swelled to 668 by October of 1968, operating over 324 O-1 and O-2A “Super Skymaster” aircraft in 5 TASSs.⁴⁶ In 1968 alone, these aircraft flew over one third of the total U.S. combat time in Vietnam, averaging over 29,000 flying hours a month.⁴⁷



Figure 3: OV-10 Bronco Marking a target in South Vietnam

The single-engine O-1's advantage lay in its slow speed and extended loiter capability, which allowed controllers ample time to observe enemy positions and control strikes. By June of 1965, General Westmoreland divided South Vietnam into sectors

⁴⁴ Lester, 110.

⁴⁵ Ibid., 114.

⁴⁶ Ibid., 117.

⁴⁷ Ibid., 117.

which could be patrolled by the O-1 on a daily basis.⁴⁸ Though always in high demand for CAS and visual reconnaissance missions, the O-1 had its limitations. Its slow speed delayed its response time, once alerted, it had limited target marking and night flying capability, and it was susceptible to enemy ground fire. The introduction of the two-engine O-2 in 1966 somewhat improved speed, target marking and night capability, but did little to enhance survivability.⁴⁹ The introduction of the OV-10 “Bronco” in 1968 brought in more firepower but, while the OV-10 was less susceptible to small arms fire, it was still vulnerable to larger anti-aircraft artillery (AAA) and surface-to-air missiles (SAMs).⁵⁰

To increase tactical air’s ability to support the Army at night, the Air Force introduced the first gunships to South Vietnam in 1965. The AC-47 “Spooky” was a C-47 fitted with ten side-firing 30-caliber machine guns. The AC-47 had a long loiter time, could accurately fire above 3,000 feet, and had flare dispensers. Spooky’s potential was soon realized during CAS missions and its role expanded to include strike and flare missions along the Ho Chi Minh trail.⁵¹ The success of the AC-47 led to the introduction of the AC-119K and to the development of the AC-130 by 1967. With an improved fire control system, increased firepower, and sensors for better night capability, the AC-130 proved to be the best truck-killing platform of the war.⁵²

⁴⁸ Ibid., 121.

⁴⁹ Ibid., 111.

⁵⁰ Ibid., 133.

⁵¹ Schligh, 91.

⁵² Schligh, 237, Mark, 336, and Momyer, 211.



Figure 4: AC-47 “Spooky”

By the spring of 1967, the success of U.S. military activity in South Vietnam, Laos, and North Vietnam convinced communist states that the North Vietnamese needed additional support. The Soviets stepped up shipments of SAMs, AAA, and small arms, making the O-1 and O-2 FAC and AC-130 operations along the Ho Chi Minh Trail and DMZ considerably more dangerous.⁵³

Operation Commando Sabre and Misty FAC Operations in 1967

The influx of anti-aircraft weapons into Route Package I and the Laos panhandle had significantly increased the risk to U.S. FACs by May of 1967. In response to the loss of two O-1s to SA-2 surface-to-air missiles, Seventh Air Force Commander, Lieutenant General William W. Momyer, approved a test program to place FACs into the rear seat of

⁵³ Lester, 129. Momyer, 217.

fighter aircraft.⁵⁴ Their higher speed allowed fighters to operate in the high threat areas deemed too dangerous for the slow O-1s and O-2s. Codenamed Operation Commando Sabre, the initial test selected the F-100F, the two-seat version of the North American F-100 Super Sabre, to fly single-ship missions.⁵⁵

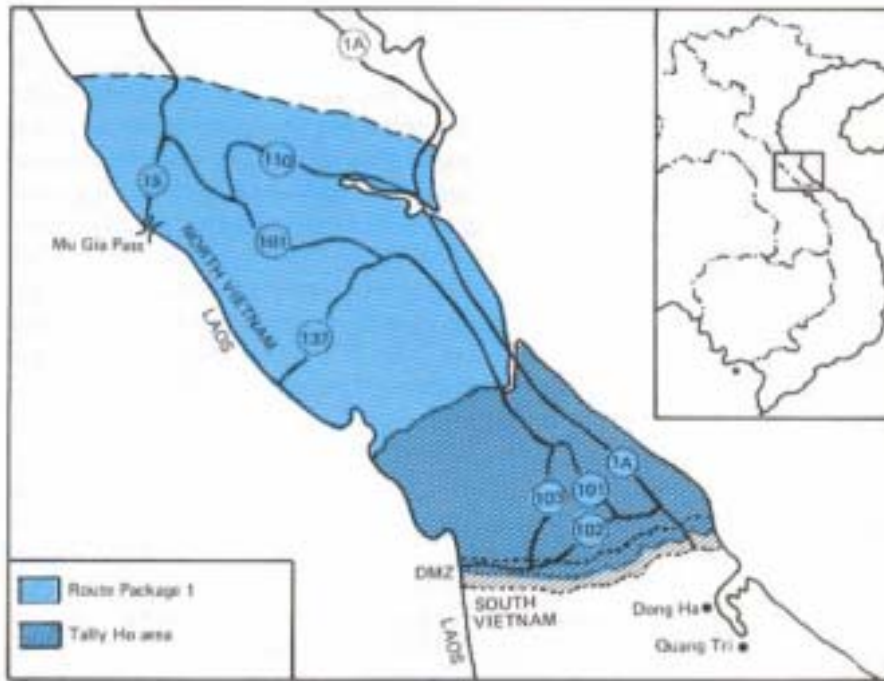


Figure 5: Route Package I and Tally Ho area⁵⁶

Under the callsign of “Misty”, these Fast FACs became known as “Misty FACs.”⁵⁷ Their mission was to “...impede the enemy logistic flow within and through Route Package One / Tally Ho to the maximum extent possible.” They were also to

⁵⁴ *The Air Force in Southeast Asia. FAC Operations 1965-1970*, (Washington: Office of Air Force History), 173.

⁵⁵ The F-100F was the two-seat variation of the single seat F-100C multi-role fighter-bomber. It was originally designed for use in initial F-100 training and for upgrade and orientation sorties. Operation Commando Sabre continually competed for the use of F-100Fs against the required upgrade sorties for newly arrived F-100C pilots.

⁵⁶ Schligh, 207.

⁵⁷ Lester, 170.

“suppress enemy defenses as practicable to maintain a permissive environment for strike reconnaissance and FAC operations.”⁵⁸

On 28 June, the Commando Sabre mission was assigned to Detachment 1 of the 416th Tactical Fighter Squadron (TFS), 37th Tactical Fighter Wing (TFW), stationed at Phu Cat, South Vietnam.⁵⁹ The 37th TFW consisted of two squadrons of F-100s.⁶⁰ Commando Sabre came with neither aircraft nor maintenance, relying instead on the 37th TFW to supply both.



Figure 6: F-100 on landing roll at Phu Cat

Though the F-100 was suitable for the Fast FAC mission, it was the tactical innovation of pilots who volunteered for this new mission that brought about its success. Commando Sabre operations initially consisted of 16 to 18 pilots and a dedicated intelligence officer.⁶¹ The pilots, including a commander and operations officer, were drawn primarily from the 37th TFW, with other F-100 units in Vietnam providing extra pilots on a temporary duty basis.⁶² Initially, four FACs from the 504th Tactical Air

⁵⁸ Extract. 7AF OPOD (Draft) 504-67, 28 June, 1967. Contained in History of Commando Sabre Operation July – September 1968, HRA K-WG-37 HI, document 1.

⁵⁹ *The Air Force in Southeast Asia. FAC Operations 1965-1970*, 173.

⁶⁰ 37th TFW History Jan-Mar 1968, vol I, 17. In February, 1968 the wing expanded to three squadrons with the arrival of the 355th TFS.

⁶¹ The total number of pilots fluctuated over the three year period, sometimes rising to as many as 22 or dropping to as low as 14 pilots, depending on the daily flying schedule. The schedule, in turn, was dependent on the number of F-100Fs available.

⁶² History of 37th TFW, Jul-Sep 67, 416th Detachment 1 Operation Commando Sabre Roster.

Support Group were also included to instruct the F-100 pilots in FAC techniques.⁶³ The lengthy operations at low altitude and over heavily defended territory made the Misty FAC mission extremely dangerous. Pilots were, therefore, solicited on a volunteer basis to perform the duty for 120 days or 75 missions, whichever came first.⁶⁴

All F-100 pilots selected for Misty had combat experience in Close Air Support missions in South Vietnam. Some also had prior FAC experience. Still some pilots, who had flown jets in Europe from which the refueling probes had been removed, were not qualified for aerial refueling. The checkout program consisted of on-the-job training in the rear cockpit with an experienced Misty FAC in the front. The FAC would also demonstrate visual reconnaissance, strike control and battle damage assessment techniques.⁶⁵

By the beginning of July, 1967, Commando Sabre Operations were scheduling two sorties a day, with a single air refueling per sortie.⁶⁶ Initially unopposed, Misty FACs began encountering small arms and AAA fire on 5 July, after which enemy ground fire became common.⁶⁷ Through July and August, the Misty FACs continued to refine their tactics and sharpened their skills at visual reconnaissance and air strike control. They located truck parks, bridges, and air defense sites. In July alone, Misty FACs flew 82 missions and directed 126 strikes.⁶⁸ Although Misty FACs could locate and mark the targets, the inability of fighters to drop unguided bombs for direct hits on such hardened targets as AAA pieces reduced the overall extent of battle damage.

⁶³ *The Air Force in Southeast Asia. FAC Operations 1965-1970*, 173.

⁶⁴ History of 37th TFW Jul-September 1967, memo from Lt Col Donald Jones to Col Edwin Schneider. These limits would later be extended, as evidenced by Capt Dick Rutan being hit on his 104th mission after flying as a Misty from 30 January – 17 August 1968. History of Commando Sabre Operation July-September 1968, History of 37th TFW, Jul-Sep 68, vol. II, 93.

⁶⁵ Dick Durant, "Dick Durant's Observations," *Misty: First Person Stories of the F-100 Misty Fast FACs in the Vietnam War*, Don Shepperd (ed.), 246. The Misty upgrade program consisted of five missions in the backseat, followed by additional missions in the front seat with a Misty instructor pilot in back. Checkout varied but, following the initial five backseat missions, pilots alternated between front and back seats for an additional 5-15 missions in training status until fully checked out.

⁶⁶ History of 37th TFW, Jul-Sep 67, 20.

⁶⁷ *The Air Force in Southeast Asia. FAC Operations 1965-1970*, 179.

⁶⁸ *Ibid.*, 179.

The first setback for the Misty FACs occurred on 26 August, 1967 when Misty commander Major George “Bud” Day and Captain Corwin M. Kippenhan were conducting visual reconnaissance of an active SAM site 20 miles north of the DMZ. They were forced to eject when their F-100F was hit by 37mm flak.⁶⁹ While Kippenhan was rescued, Major Day was eventually captured.⁷⁰ From July of 1967 to October of 1968, Misty FACs flew 1498 sorties over Tally Ho and Route Package I, losing a total of 9 aircraft for a loss rate of 6.01 per thousand sorties.⁷¹ Of the 18 pilots who ejected, 12 were rescued, 3 were captured and 3 were listed as Missing in Action.⁷² From November 1968 to May 1970, interdiction operations shifted to Laos, for which Misty FACs flew a total of 3072 sorties, losing 11 aircraft for a loss rate of 3.58.⁷³ Of the 22 pilots who ejected, 18 were rescued and 4 were listed as Missing in Action.⁷⁴ Misty FAC missions had a loss rate over three times as high as that of the wing’s other F-100s, which conducted CAS and strike missions.⁷⁵

September 12, 1967 kicked off Operation Neutralize, a 6-week effort to suppress heavy North Vietnamese artillery attacks on U.S. positions across the DMZ.⁷⁶ O-2 FACs controlled strikes south of the DMZ while Misty FACs focused attacks on artillery positions in the area just north of the border between North and South Vietnam. Misty FAC success was heralded in a 7th AF message to PACAF which stated that the “...F-100F program has proven highly successful in identification of targets and BDA in areas

⁶⁹ History of 37th TFW, Jul-Sep 67, 23.

⁷⁰ Major Day would eventually receive the Medal of Honor for his evasion efforts and conduct as a POW.

⁷¹ *Summary of F-100 & F-4 Losses in the FAC/VR Role July 1967- July 1970*, 7.

⁷² *Ibid.*, table D2.

⁷³ *Ibid.*, 7.

⁷⁴ *Ibid.*, table D2.

⁷⁵ History of 37th TFW, Jan-Mar 69, volume II, 21.

⁷⁶ *The Air Force in Southeast Asia. FAC Operations 1965-1970*, 179.

where O-1 and O-2 cannot operate.”⁷⁷ The message also requested an expansion of Misty operations to include additional sorties and extended coverage in Laos. With the onset of poor weather in Route Package I in November, Misty operations began in sections of the Laos panhandle.⁷⁸

The Tet Offensive and Misty FAC Operations in 1968

On the 30th of January, 1968 the North Vietnamese commenced a conventional ground offensive into Vietnam during the traditional Vietnamese holiday of Tet.⁷⁹ U.S. air efforts focused throughout January and February on close air support in South Vietnam.⁸⁰ The elevated consumption rate of supplies incurred by the offensive forced the North Vietnamese to increase the number and size of truck convoys. Though the northeast monsoon season severely hampered Misty interdiction efforts in January and February, March ushered in clearer skies and a higher interdiction success rate. The single most successful Misty FAC mission, “The Great Truck Massacre” of 20 March, 1968, is regaled as the day that Misty FACs located and controlled strikes on a large truck convoy, damaging or destroying some 79 trucks.⁸¹ Misty FACs’ detailed knowledge of the terrain and North Vietnamese defenses in Route Package I and Tally Ho proved invaluable, not only for FAC operations, but for rescue efforts as well. Misty FACs assisted in several successful Combat Search and Rescue (CSAR) operations, locating the position of downed aircrew and suppressing enemy ground fire for rescue

⁷⁷ History of 37th TFW, Jul-Sep 67, 25.

⁷⁸ History of 37th TFW, Oct-Dec 67, 15.

⁷⁹ Schligh, 282.

⁸⁰ Momyer, 319.

helicopters.⁸² The versatility of the Misty FACs was further demonstrated in May and July when they began spotting for naval gun fire on fixed positions in Route Package I.⁸³

The capability of the Misty FAC to locate and strike trucks did not go unnoticed by the North Vietnamese. In response, they began movements of supplies during poor weather and at night. By June of 1968, Tally Ho and Route Package I were free of daylight enemy truck traffic.⁸⁴ On 12 and 13 June, Misty FACs conducted two night sorties to test the F-100F for night visual reconnaissance. The results were positive and 7th AF gave immediate approval for night operations in Route Package I. While Misty FACs flew 46 night sorties in July and August, regularly scheduled night missions were discontinued on 21 August.⁸⁵ Continual difficulties in marking targets and conducting attacks, coupled with the risk of mid-air collision, plagued night strike control. Night sorties were then irregularly scheduled until completely halted in October.⁸⁶

The success of Misty FAC operations was somewhat offset by the limited number of F-100F airframes available and the plans for the jets removal from Vietnam by 1970. In response, 7th Air Force turned to another multi-role fighter to augment and eventually replace the F-100F. The first F-4's to join the Fast FAC mission were those of the 366 TFW at DaNang Air Base. Misty FACs flew F-4 pilots in the backseat of F-100Fs on upgrade and area orientation sorties. Select Misty FAC pilots also went to DaNang to fly with the F-4 "Stormy" FACs to complete their checkout.⁸⁷

⁸¹ History of 37th TFW, Jan-Mar 68, 21.

⁸² History of 37th TFW, Jan-Mar 68, 24-5.

⁸³ History of 37th TFW, Jul-Sep 68, 25.

⁸⁴ History of 37th TFW, Apr-Jun 68, 21.

⁸⁵ *The Air Force in Southeast Asia. FAC Operations 1965-1970*, 181.

⁸⁶ *Ibid.*, 182.

⁸⁷ History of Commando Sabre Operations, Jul-Sep 68, 40.

Another initiative introduced in August, 1968 was the Sun Valley Test, a hunter-killer concept capitalizing on the F-100 strikers already collocated with Operation Commando Sabre at Phu Cat.⁸⁸ The F-100 strikers carried a full load of bombs and flew at medium altitude, trailing several miles behind a faster and more maneuverable Misty FAC on visual reconnaissance at low altitude. Once targets were located, the F-100 strikers were already in position for a quick attack. While the concept showed great potential, the loss of two Misty aircraft compelled 7th AF to direct a review of operations. It was concluded that the North Vietnamese restriction on daylight movement had been forcing Misty FACs to increase their exposure time in locating targets. 7th AF then imposed restrictions to reduce exposure time, which temporarily halted hunter-killer operations and reduced the overall effectiveness of Misty FACs in locating valid targets.⁸⁹

President Johnson's November, 1968 Bombing Halt and Misty FAC Operations in Laos in 1969

Misty FACs continued flying missions into Tally Ho and Route Package I until President Johnson issued the Executive Order of 1 November, 1968 prohibiting bombing in North Vietnam.⁹⁰ Attacks were then shifted into Laos, redirecting the Misty FAC mission to visual reconnaissance of the southern areas of Steel Tiger in the Laotian panhandle. The lower AAA threat in Laos further allowed Misty FACs to perform visual reconnaissance at lower altitude and to reintroduce hunter-killer tactics.⁹¹

⁸⁸ Ibid., 41.

⁸⁹ History of Commando Sabre Operations, Jul-Sep 68, 17.

⁹⁰ Ibid., viii.

⁹¹ History of Commando Sabre Operations Oct-Dec 1968, 11.



Figure 7: Areas of Operation in Laos in 1969⁹²

February of 1969 brought the additional task of photo reconnaissance to the mission. While Misty FACs had been using 35mm high speed cameras in the rear

cockpit to photograph potential target areas for some time, Operation Search formalized a working arrangement between Misty and the 460th Tactical Reconnaissance Wing.⁹³ This was a four-month long effort to familiarize RF-4C crews with Misty FAC tactics.⁹⁴ Misty FACs also continued to demonstrate their prowess at AAA suppression during rescue operations. As the weather improved through the spring and Misty FACs became more and more familiar with the Laotian terrain, the number of targets identified and attacked began to rise.⁹⁵

It was during this period that the 37th TFW at Phu Cat converted from the F-100 to the F-4D. In May, Misty FAC operations deployed with the 416th TFS to Tuy Hoa Air Base where F-100 operations continued with the 31st TFW.⁹⁶ Misty's area of responsibility expanded in August from the southern areas of the Laotian panhandle to include the entire Steel Tiger region.⁹⁷ However, the number of daily missions scheduled was reduced from seven to five at the behest of the 31st TFW, which was in need of additional F-100F airframes to train incoming F-100 pilots.⁹⁸ In response to the overall lower experience level of the 31st TFW F-100 pilots, the Misty FACs were forced to reevaluate their own manning and training program. Roughly half of the pilots they began receiving were inexperienced. The inexperienced pilots flew with Misty FAC instructors and completed a FAC upgrade program prior even to becoming flight leads.⁹⁹

In October, 1969 the number of daily missions scheduled was further reduced from five to four and a theater-wide shortage of tanker support cut back the length of

⁹² Momyer, 201.

⁹³ History of Commando Sabre Operations, Jan-Mar 69, 10.

⁹⁴ History of Commando Sabre Operations, Apr-Jun 69, 16.

⁹⁵ History of Commando Sabre Operations, Jan-Mar 69, 21.

⁹⁶ History of 37th TFW, Apr-Jun 69, 15.

⁹⁷ History of Commando Sabre Operations, Jul-Sep 69, vii.

⁹⁸ Ibid., 9.

each mission.¹⁰⁰ Misty FAC time on station was reduced from 10 hours a day, based on a six sortie schedule, to just under 3 ½ hours with the four sortie schedule. A combination of good weather, increased ground activity, and the arrival of 3 replacement F-100Fs in early 1970 did return the daily schedule to six missions, but the lack of tanker support continued to limit on-station times.¹⁰¹

The loss of two aircraft on 18 and 19 January, along with 8 hits on aircraft in just 19 days, brought about a change of tactics for Misty operations. Whereas visual reconnaissance had been conducted at altitudes as low as treetop level, 7th AF raised the altitude to 4500 feet Above Ground Level (AGL) and confined strafing to the support of rescue missions only.¹⁰² This greatly reduced the ability to visually acquire targets and forced Misty FACs to rely more heavily on photographs shot by the back seater.

The additional loss of an aircraft in late March and heavy battle damage of aircraft in late April and early May compelled 7th AF to bring the entire Commando Sabre program under review. Given the limited number of available F-100F airframes and experienced pilots, it was determined that Misty FAC operations should no longer be continued. The Commando Sabre Operation was officially terminated on 14 May 1970.¹⁰³ Although the F-100F was no longer used, the F-4D continued flying Fast FAC missions through the end of the Vietnam War.

⁹⁹ Ibid., 5.

¹⁰⁰ History of Commando Sabre Operations, Oct-Dec 69, 9.

¹⁰¹ History of Commando Sabre Operations, Jan-Mar 70, 8.

¹⁰² History of Commando Sabre Operations, Jan-Mar 70, 12.

¹⁰³ History of Commando Sabre Operations, Apr-Jun 70, 13.

Chapter 3

MISTY FAC TACTICS

Misty FACs were born out of the necessity of combat. Facing a rising flow of supplies from North Vietnam to the Viet Cong in the south and increasing surface to air threats, the USAF was forced to rethink its interdiction campaign. Politically restrained from air attacks on lucrative targets in the North, the U.S. military was further restricted from inserting ground forces into North Vietnam. The U.S. was forced to rely on airborne FACs to interdict supplies in southern North Vietnam and along the Ho Chi Minh Trail in Laos. However, the slow-moving O-1 and O-2 FACs, initially well-suited for reconnaissance operations north of the DMZ, found themselves highly vulnerable to Russian supplied SA-2s and large caliber anti-aircraft guns.

The USAF responded by introducing the Fast FAC, an elite mission for which only the most experienced pilots could volunteer. Two fighter pilots, with varying degrees of Forward Air Control training or experience, would strap themselves into an aging, two-seat F-100F and venture out single-ship to the north to ferret out and control strikes on trucks, AAA sites and SAMs. This chapter depicts a typical Misty mission.¹ It covers the essential mission elements of visual reconnaissance, strike control, and search and rescue operations, all conducted under the relentless threat of deadly North Vietnamese gunners.

¹ The mission described in this chapter did not actually take place. It is, rather, a hypothetical mission incorporating mission elements from actual Misty missions. The F-105 air strikes and F-4 search and rescue mission depicted here are representative of actual missions.

The first Misty sortie of the day, Misty 11, is scheduled to arrive on station in Route Package I by dawn. Subsequent missions are scheduled throughout the day to maintain constant coverage until nightfall.² The pilots report to Misty Operations 2 ½ hours prior to takeoff. They must be briefed by intel on significant events, such as the loss of any aircraft or aircrews in the past 24 hours, updates to AAA locations, and any high priority target photos which may have arrived from 7th Air Force headquarters overnight.³

Little Intelligence Surveillance and Reconnaissance (ISR) information is available from outside sources. Most information has been derived from the mission reports of recent Misty sorties. A master map in the main briefing room maintains the most current enemy ground order of battle, including AAA sites and the locations of recently attacked targets.

The pilots review the relevant section of the air tasking order, referred to as the fragmentation order, or “frag.” This includes on-station times, air refueling information, and other information pertinent to daily flight operations. They also review and update their detailed maps, extract coordinates for potential targets, and conduct a flight briefing. The rear-seater, commonly known as the GIB (“Guy in Back”) also prepares the 35-mm high-speed camera for photo reconnaissance. When ready, the pilots proceed to life support where, in addition to donning their combat flight gear, they each pack an extra

² The ability to provide constant coverage varied, depending on the number of F-100Fs available to fly. The bombing halt of North Vietnam in November, 1968 saw Misty FACs transitioning to operations in Laos.

³ Ray Bevivino, “The Start of Misty Intel,” *Misty: First Person Stories of the F-100 Misty Fast FACs in the Vietnam War*, Don Shepperd (ed.), 43.

survival radio and bottles of frozen water.⁴ The pilots step to the jet 45 minutes prior to takeoff and split the preflight duties to prepare the F-100F for flight.

F-100F and Misty FAC Munitions Load

The F-100F “Super Sabre,” more affectionately known as the “Hun,” is a good choice for the Fast FAC mission for several reasons. With its bubble canopy, the F-100F provides good front and rear cockpit visibility.⁵ When carrying a light load, it can maintain both airspeed and maneuverability, capabilities critical for survival at low altitude in a high threat environment. The Hun is simple, cheap, and rugged, able to take a hit without disintegrating or losing flight control.⁶ In addition, experienced F-100 pilots are readily available from the four fighter wings in South East Asia tasked with “in country” (South Vietnam) Close Air Support missions.⁷

⁴ Shepperd, ix. Of the 155 Misty pilots, 42 were shot down over Vietnam or Laos, for an overall shootdown rate of 27.7%. 34 were shot down flying Misty missions, 8 others were shot down flying other F-100 missions or other aircraft on subsequent tours.

⁵ Commando Sabre Message dated 31 July 1967, Supporting Documents for Checo Study: *Strike Control and Reconnaissance (SCAR) in SEA, 1965-1968*, 1962-68 v2. The initial Fast FAC concept called for a qualified FAC to perform his duties in the backseat of a two-seat fighter.

⁶ Mentioned by numerous former Misty FACs in January 2002 Questionnaire.

⁷ History of Commando Sabre Operations, Jul-Sep 68, 7.



Figure 8: F-100F with Combat Load¹

Though a good choice for Fast FACing, the Hun does have its weaknesses. Built in the late 1950s, the F-100 is old and slated to leave the active Air Force inventory by 1970.² Also, relatively few two-seat F-100Fs are available in Vietnam, assigned primarily to upgrading and training newly arrived F-100 pilots in theater. High loss rates and frequent battle damage have begun to limit the availability of F-100F airframes and to plague Misty operations. This has proven to be the primary obstacle to expanding Misty coverage. The F-100 also has a large turn radius, demanding the near constant use of full throttle with occasional inputs of minimum afterburner in order to maintain sufficient airspeed for jinking. For self-protection, the F-100F does not yet have Radar Homing and Warning (RHAW) gear and carries neither electronic counter measure

¹ Note rocket pod on outboard station and external fuel tanks on inboard station.

²USAF museum website, <http://www.wpafb.af.mil/museum/research/fighter/f100f.htm>, accessed 28 Nov 01.

(ECM) pods nor chaff.³ The Hun has no radar, only one Ultra High Frequency (UHF) radio, and no inertial navigational system. Its only navigational aid is a TACAN.⁴ Finally, the F-100 refuels by probe and drogue, a method less widely used, while the more modern USAF fighters and bombers have transitioned to boom refueling.⁵ Dedicated tankers are thus required to support Misty FAC operations.



Figure 9: F-100F Probe and Drogue Refueling

Another detractor from the F-100 is the limited thrust from its single engine, which reduces the quantity of weapons that can be loaded for the low altitude mission. An important part of Misty 11's preflight check insures that the jet is loaded with the proper external configuration. FAC missions require a specialized munitions load which maximizes available fuel, minimizes drag, and allows for target marking. The standard

³ F-100s eventually did receive RHAW gear, however operations had already shifted to Laos where there were no radar guided air defenses.

⁴ TACAN (Tactical Aid to Navigation) is a ground station that transmits both range and bearing information.

⁵ Bill Douglas, "Misty Experience: The Beginning," *Misty: First Person Stories of the F-100 Misty Fast FACs in the Vietnam War*, Don Shepperd (ed.), 35.

loadout includes two LAU-59 rocket pods on the outer stations, each containing seven 2.75-inch folding fin white phosphorous rockets.⁶ These rockets are the primary means for Misty 11 to quickly and accurately mark the target for strike aircraft. Though Misty FACs fly primarily during the day, a limited number of night sorties are flown. On night missions, one or both of the rocket pods are swapped out for SUU-25 dispensers, which carry eight M-24 night illumination flares per pod.⁷

Two 355-gallon external drop tanks are loaded onto the inboard stations, adding an extra 5,000 lbs. of fuel. The extra fuel extends on-station times for Misty FACs by as much as 20 to 30 minutes between refuelings. Internally, two M-39 20mm cannons are loaded with 325 rounds of High Explosive Incendiary (HEI) ammunition.⁸ The 20mm gun has proven less effective than rockets in marking targets, however. It is more difficult for fighters to see the impacts of the 20mm rounds and the limited tactical effective range of the gun (around 3,500 feet) leaves the Misty FAC more exposed to ground fire while strafing. Due to the extra risk, strafing is reserved for rescues and against high value fleeting targets.

The inner two stations remain empty to keep the jet with less drag. Though ECM pods were initially tested on these stations, they proved ineffective and have been abandoned.⁹ Misty FACs, like all fighter pilots, prefer more ordnance, greater thrust, and longer endurance. However, given the flight characteristics of the F-100F, the mix of rockets, bullets and fuel proves more than adequate for the task at hand.

⁶ History of Commando Sabre Operation July-September 1968, History of 37th TFW Jul-Sep 1968, 14.

⁷ *Weapons File 1999*, (Eglin AFB, FL: Armament Product Group Manager, January 1999), 10-25.

⁸ History of Commando Sabre Operation January – March 1969, History of 37th TFW Jan-Mar 1969 vol IV, 11.

Misty Flight Profile

After the preflight walk-around, the pilots climb into their jet, start the engine, complete the remaining checklist items and taxi to the runway. Upon takeoff, Misty 11 climbs to 20,000 feet and contacts Panama, the radar site at DaNang providing radar vectors to Route Package I. When artillery is active along the DMZ or when the weather is poor in RP I, Misty can fly over the Gulf of Tonkin and let down through the weather on a TACAN radial over the water.¹⁰ It takes about 30 minutes to reach RP I and, in the process, Misty 11 switches to Cricket (or Hillsboro), the airborne command and control center (ABCCC) in charge of RP I.¹¹ The flight receives an area update and begins a fuel conserving enroute descent 40 miles prior to the target area. Completing the descent check, they arm the rocket and gun, and begin the preplanned target search.¹²

During this first visual reconnaissance/strike control (VR/SC) period, Misty 11 evaluates the weather for visual flight operations, follows the preplanned VR route, and conducts a search of potential target areas, looking for any unusual signs that might indicate enemy activity. After 30 minutes of verifying targets and locating active areas, it is time for the first of two aerial refuelings.

Climbing out over the Gulf to the Blue Anchor tanker track, Misty 11 recontacts Cricket and coordinates for the available fighters to strike the targets that have been

⁹ Bill Mayberry, "Stories by Bill Mayberry, Misty 5," *Misty: First Person Stories of the F-100 Misty Fast FACs in the Vietnam War*, Don Shepperd (ed.), 52. Two ECM pods were required, but when placed on the available inboard stations they tended to highlight rather than jam enemy radars.

¹⁰ Commando Saber Operating Instruction 55-1, History of 31th TFW Jan-Mar 1970 vol 1, 3-3.

¹¹ Don Jones, "A Trip into North Vietnam," *Misty: First Person Stories of the F-100 Misty Fast FACs in the Vietnam War*, Don Shepperd (ed.), 156.

¹² Commando Sabre Operating Instruction 55-1, History of 31th TFW Jan-Mar 1970 vol 1, 3-3.

located.¹³ It takes about 25 minutes to reach the KC-135 tanker track, take on fuel, and return to RP I.¹⁴ On this mission, only two refuelings are scheduled. If the next Misty FAC is unable to get airborne, however, or an aircraft is downed and search and rescue is required, as many as four or five refuelings may be necessary. Tankers have been known to disregard ROE and fly over the North Vietnam coastline in order to reach Misty FACs exceedingly low on fuel or to help a damaged bird leaking fuel to take on enough fuel to make an emergency landing at DaNang.¹⁵

The second Visual Reconnaissance/Strike Control period will entail directing strikes on targets found in the first VR/SC period. Misty 11 will have about an hour to work targets before returning to the tanker track to refuel for a third VR/SC period. This sortie is scheduled for a relatively short 4.0 hours with 2.0 hours spent in VR/SC. If fewer F-100Fs are available for the daily schedule, however, or a rescue is needed, the sortie length may increase to 6-8 hours. Table 1 provides the Misty mission profile for October 1968.

Misty FAC Mission Profile

October 1968

Reference Time (T Hour) --	Takeoff Time
T minus 2:00 --	Premission Briefing
T --	Takeoff
T – T+:30 --	Enroute to operating area

¹³ Shepperd, viii. For missions over Laos tanker tracks are located in Thailand.

¹⁴ "Mission Profile", History of Commando Sabre Operation October-December 1968, History of 37th TFW Oct-Dec 1968, Attachment 4.

¹⁵ P.K. Robinson, "Panda Rescue," *Misty: First Person Stories of the F-100 Misty Fast FACs in the Vietnam War*, Don Shepperd (ed.), 202.

T+:30 – T+1:00 --	Visual Reconnaissance /Strike Control
T+1:00 – T+1:25 --	Refueling (9-10,000 lbs offload)
T+1:25 – T+2:25 --	Visual Reconnaissance /Strike Control
T+2:25 – T+2:50 --	Refueling (9-10,000 lbs offload)
T+2:50 – T+3:20 --	Visual Reconnaissance /Strike Control
T+3:20 – T+4:00 --	Return to base
Total Area Time	2:00
Total Flight Time	4:00

Table 1: Misty Mission Profile¹⁶

Threat Avoidance

The Misty FAC mission has been created to conduct visual reconnaissance in high threat areas where O-1 and O-2 FACs cannot survive. AAA has proven to be the greatest threat to all air operations in Vietnam.¹⁷ The replacement of slow FACs with faster aircraft has not been sufficient, however, to prevent experienced North Vietnamese gunners from claiming more kills. Still, there are four techniques Misty 11 can use to minimize the surface-to-air threat. First, they can avoid known AAA sites. As there is a direct correlation between the location of lucrative targets and the positioning of air defenses, however, Misty 11 will be forced to face active AAA. Second, they can stay

¹⁶ History of Commando Sabre Operation October-December 1968, History of 37th TFW Oct-Dec 1968, Attachment 4.

above the range of AAA by flying at higher altitudes. Remaining above 4,500 feet avoids most small arms and light AAA engagement envelopes, but the larger AAA (23mm, 37mm, and 57mm) can reach well above that level.¹⁸

These higher altitude tactics are effective in the coastal plain of Route Package I, where targets are relatively in the open, compared to the mountainous areas of western RP I and the triple jungle canopy of Laos along the Ho Chi Minh Trail. Here, well-concealed and camouflaged vehicles are harder to identify and require low altitude passes to confirm as targets. Although there are fewer AAA pieces larger than 23mm, the Misty FACs operate below 1,000 feet, in the heart of small arms and light AAA envelopes.¹⁹

The third way to avoid AAA is to spoil the gunner's aiming solution. Since it takes between 3 to 7 seconds for AAA bullets to travel to where the gunner is aiming, if the gunner does not lead the fighter sufficiently, the bullets will fly harmlessly behind the aircraft. Even if the gunner does calculate the proper lead, if the aircraft adjusts its flight path during the bullet's 3 – 7 second time of flight, the bullets will likewise miss. Taking advantage of this knowledge, Misty 11 flies a 3-dimensional profile, constantly jinking to vary the flight path. Maintaining a minimum of 400 knots indicated air speed (KIAS) is essential to prevent the jet from "wallowing" when G's are applied. Misty 11 must smoothly adjust the angle of bank and altitude while maintaining a 1 ½ to 2 G constant loading on the aircraft.²⁰ Above 10,000 feet, however, it is acceptable to reduce the bank angle and lighten the G load. Two hours of jinking is physically demanding on both pilots and nauseating to the GIB, who is head down plotting targets.

¹⁷ Of the 34 Misty aircraft shot down, all were hit by AAA or small arms.

¹⁸ History of 31th TFW Jan-Mar 1970, 12. After the loss of two aircraft in January 1970, 7th Air Force restricted Misty FACs to above 4,500 feet, thus underscoring the importance placed on remaining above the threat. History of 31th TFW Jan-Mar 1970, 12.

The final way to avoid AAA is to minimize the number of passes within range of a gun and to fly an unpredictable flight path. Misty 11 must avoid orbiting around targets and, if a second pass is necessary for target identification, they must first exit the target area and return later for confirmation.

Visual Reconnaissance

Being able to survive is prerequisite to being able to strike targets. However, before a truck or AAA site can be destroyed, it must first be located. A good Misty FAC has the ability to consistently locate and identify valid targets. Such a FAC possesses three particular qualities. First, he must have recent and in-depth experience with the area of operations. It takes hour upon hour of close, daily observation to memorize distinct terrain features, LOCs, and active and inactive AAA sites.²¹ He must be able to note subtle changes which indicate enemy activity, while jinking at over 400 knots. It takes most Misty FACs ten to twenty missions to develop such a high level of perception.²²

¹⁹ General Tony McPeak , Misty FAC questionnaire, January 2002.

²⁰ History of Commando Sabre Operation October-December 1968, 3-1.

²¹ In fact, when Misty FAC operations were shifted from RP I to Laos with the November, 1968 bombing halt, it took until January of 1969 for Misty FACs to become sufficiently familiar with the area to regain previous strike levels. History of 37th TFW Jan-Apr 1969, 37.

²² Commando Sabre Operating Instruction 55-1, History of 31th TFW Jan-Mar 1970 vol 1, 4-2.



Figure 10: Trucks in Route Package I during the Christmas 1967 bombing halt

While a pilot may develop a sense for where to look for targets with time, a visual scan pattern is another necessary tool for target acquisition. An appropriate technique is described in the Commando Sabre Operating Instruction 55-1:

Because the basic minimum of 400 KIAS and 4500 feet altitude is closely observed, special visual techniques similar to reading printed matter are used. The eyes jump from point to point, locking on to and closely searching each point selected before jumping to the next. Select small areas because high aircraft velocity does not allow sufficient look time to search large areas. A point selected for search may be observed from different angles as the aircraft passes over it. This allows observers to acquire targets by looking “into the trees” and to take advantage of any slanted

light due to sun angle. Do not allow your eyes to drag along the ground; move them from point to point.²³



Figure 11: Truck park in treeline

This visual scanning technique can be modified, depending on the type of targets being sought: road reconnaissance (road recce) for trucks parked along the sides of roads differs greatly from scanning for AAA sites when preparing a survivor's position for rescue. For road recce, a series of unpredictable S turns is flown along the LOC. These 90-degree banked turns are conducted while varying altitude for full 3-dimensional maneuvering. To effectively conduct road recce, the pilot must know the road well

²³ Commando Sabre Operating Instruction 55-1, History of 31th TFW Jan-Mar 1970 vol 1, 4-2.

enough to anticipate abrupt turns and maneuver appropriately.²⁴ The following figure provides an example of a typical flight path for road recce. Once the Misty FAC locates the target, he continues on so as not alert the truck drivers that they have been detected. He may then return with fighters to strike the trucks later.²⁵

MISTY FAC ROAD RECONNAISSANCE

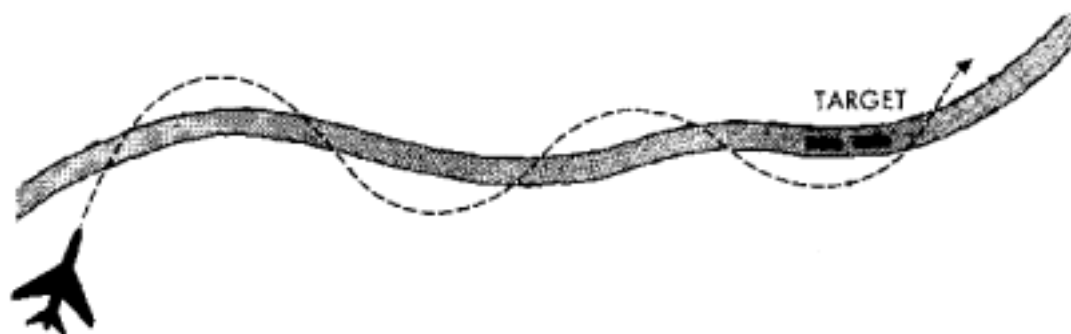


Figure 12: Road Reconnaissance²⁶

Locating an occupied AAA site requires still a different technique. Hundreds of AAA sites, mostly empty, dot the RP I landscape. The unoccupied sites are easily discernable, while the occupied sites are camouflaged and more difficult to locate. As one Misty FAC recalls:

There are hundreds of unoccupied gunsites around the area. They are the dish-shaped holes in the ground surrounded by dead vegetation, but who wants to find unoccupied gunsites? The occupied sites are the natural-looking trees and shrubs within one mile of the unoccupied sites. Since the distance between unoccupied

²⁴ General Tony McPeak Misty FAC questionnaire, January 2002.

sites is usually less than one quarter mile, you simply subtract the unoccupied sites from the area, and everything else is an occupied gunsite!²⁷

As another Misty FAC expresses it “I think it [is] rather like a country boy teaching a city boy how to spot a bullfrog, because once you get so that you can see an occupied AAA site and once you recognize it, it becomes very easy to locate them.”²⁸ Just because a AAA site is occupied, however, does not mean it is active. North Vietnamese gunners have learned not to fire at Misty FACs unless they believe they can fire unobserved or if their site or the target they are tasked to protect comes under direct fire.²⁹ Although NV gunners will think twice about shooting at a Misty, once a AAA site has fired and believes its position to be revealed, the site will relocate overnight. The lesson to be drawn from this is that, once a AAA site is located, it is best to leave it alone until it becomes active or another reason arises to attack it.³⁰ In the long run, it is better to know where the silent guns are than to drive them into hiding.

²⁵ This figure is deceptive since it appears the trucks are traveling along the trail. This rarely occurred during the day, rather trucks were parked and hidden alongside the road.

²⁶ *The Air Force in Southeast Asia. FAC Operations 1965-1970*, 176.

²⁷ Don Jones, “A Trip into North Vietnam,” *Misty: First Person Stories of the F-100 Misty Fast FACs in the Vietnam War*, Don Shepperd (ed.), 159-160.

²⁸ Major Charles Neel, USAF Oral History Program, Interview #493, 2 December 1971, 10.

²⁹ *Ibid.*, 10.

³⁰ Neel, 12. One valid reason to attack might be to clear a corridor for a H-3 Jolly Green helicopter during a rescue mission.

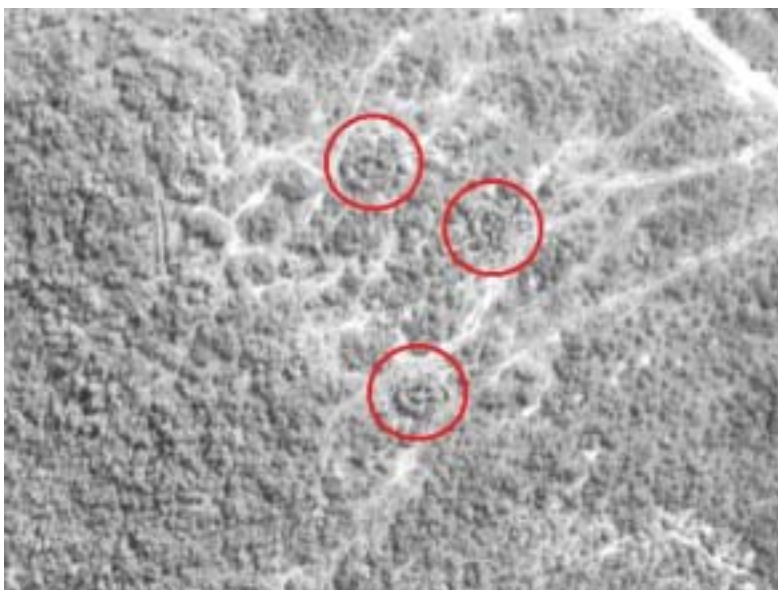


Figure 13: Camouflaged AAA Site in Route Package I on 19 Nov 67.

The final quality of a good Misty FAC has to do with a pilot's natural ability. Some FACs are simply better at finding targets than others. Misty FACs such as Keith Heineger and Charlie Summers are venerated for their ability to locate targets where mere mortals can see nothing more than a clump of trees.³¹ While experience, coupled with a well-developed scan technique, will add to the number of targets a FAC can locate, it can never outdistance the fabled accomplishments of a blessed few. This innate ability, rather like the inexplicable prowess of a star athlete, is inherent in the true predator.

³¹ Bob Blocher, "Misty Quickies," and Lanny Lancaster, "From My Records," *Misty: First Person Stories of the F-100 Misty Fast FACs in the Vietnam War*, Don Shepperd (ed.), 66 and 191.

Strike Control

Early in the second Visual Reconnaissance / Strike Control period, Misty 11 has identified two stationary trucks underneath a group of trees at a suspected truck park. Three occupied AAA sites are just south of the target, but none have been active yet. Cricket informs Misty 11 that Buick, a flight of four F-105 “Thuds” weather diverted from RP 6, are inbound, and loaded with M117, 750-lb. general purpose bombs.

The target area is 12 miles inland and Misty 11 turns east to meet the Thuds off the coast. Buick checks in on the strike frequency, confirms that his flight is loaded with 6 bombs apiece, and continues toward the rendezvous point. Once visual, Buick will follow Misty 11 to the target area. As the front seater works the rejoin, the GIB begins the initial target briefing to the fighters. This briefing describes the general target area and provides the location and status of AAA sites. Target weather and winds, elevation, a local altimeter setting, a safe bailout area, and recommended run-in headings are also packed into the briefing.³²

Approaching the target, Misty 11 begins the talk-on. If successful, it will get the eyes of Buick’s flight lead on the target, alleviating Misty 11 from having to mark the target with a rocket. This is highly desirable, since the gunners often do not react until the target is marked. However, even if Buick does not have the exact target location in sight, a general area talk-on will have the fighters looking in the right direction when the rocket pass is made.

Misty 11 first establishes a cardinal direction by referring to a prominent road running through the area and labeling it “north-south.” Even though the road does not run exactly north to south, all further directions will be aligned with this new reference

(see figure 14). The talk-on begins from a prominent, easily identifiable point. Misty 11 points out a bend in a river 3 miles south of the target, calling it “the foot” because of its shape. When selecting the foot, Misty makes sure there are no other bends in the river, which Buick might mis-identify. Once Buick confirms that he is visual with the foot, Misty establishes a unit of measure, with the length of the foot east to west being equal to one unit. Misty then directs Buick to start at the heel of the foot and look 2 units north to where a small east-west dirt road makes a 45-degree turn to the northeast. Misty calls this the “45 curve” but does not continue the talk-on until Buick confirms he has the “45 curve” in sight.



Figure 14: Talk-on to Truck Park

³² History of Commando Sabre Operation October-December 1968, 4-1.

The truck park is approximately one unit west of the “45 curve” and 50 meters north of the road. Though Buick has his eyes in the area, there are several stands of trees and he cannot be sure he has the correct one in sight. Misty 11 will have to mark this target with a Willie Pete (white phosphorous) rocket.

Even though the F-100F has no computed weapons delivery system, rockets can be delivered accurately at slant ranges of up to 2 miles. Given the winds, Misty 11 quickly computes the appropriate mil depression for a 45° dive and adjusts the sight. Release altitude is calculated to recover above 4,500 feet. Misty 11 uses a curvilinear approach to minimize time spent in a straight and predictable flight path. He rolls out wings level at release altitude and fires the rocket slightly upwind. Upon impact, the light surface wind blows the blossoming white phosphorous cloud directly over the trucks.

Misty 11 immediately begins the recovery, rolling into 30 degrees of right bank and pulling 4 ½ Gs. As the jet’s nose approaches the horizon, a left rudder roll is initiated to allow the now inverted pilots to view the impact of the rocket through the top of the canopy. When they pass 30 degrees nose high, the G’s are relaxed as Misty 11 coasts up to 10,000 feet to observe Buick’s attack.³³ The mark is a good one and the smoke completely engulfs the truck park, allowing Misty 11 to make the radio call that FACs find most gratifying: “Hit my smoke!”

Buick 01 calls smoke in sight and rolls in from the east. As Misty 11 holds above the fighters, small puffs of white cloud appear above Buick 01 as he pulls off target. Misty notes the telltale smoke drifting out of one of the gun pits and identifies the rounds

as 37mm.³⁴ Buick 01's bombs hit 50 meters west of the trucks. Buick 02 and 03 correct off 01's bombs, laying their stick of bombs across the clump of trees.³⁵ A small cloud of black smoke wafts up through the trees, betraying an enemy truck now on fire. Buick 04 releases on the active gunsite and the flight departs to the west. Buick has dropped good bombs and the entire attack has taken less than 10 minutes. Misty 11 provides BDA to the fighters as 75% of ordnance on target and 100% within 50 meters. Once the target area has cooled down, Misty will return for a better damage assessment and perhaps get a good photograph.



Figure 15: F-105 Thud

³³ Commando Sabre Operating Instruction 55-1, History of 31th TFW Jan-Mar 1970 vol 1, 5-3.

Twenty minutes later, Misty 11 performs a low altitude pass over the site. While one of the trucks is smoldering, they note that the AAA site is still active. Targets, like AAA guns made from hardened steel and protected by earthen berms, are difficult to kill. Though F-105 pilots are typically good bombers, their inability to get direct hits on target not only reduces the damage done, but also increases the number of sorties required per kill.³⁶

The diverse nature of the munitions the fighters carry only adds to the complexity of killing targets. While 500 – 2,000 lb. general purpose bombs are good weapons for a variety of targets, Cluster Bomb Units (CBU-2) are sensitive to release altitude. Released too high, CBU produces a donut-shaped pattern around the target; too low and the container does not even open.³⁷ Other munitions include rockets and the 20mm gun. Though accurate, they lack the hard kill capability needed against AAA pieces.³⁸

Search and Rescue

Following the second scheduled refueling, Misty 11 begins a descent back towards RP I. The unmistakable “chirp, chirp, chirp...” of a bailout beacon cuts through the airwaves over Guard.³⁹ Misty 11 immediately turns the radio to direction finding (DF) mode and gets an initial heading for the downed aircrew’s location. Next to contact is Crown, the Search And Rescue (SAR) ABCCC. Misty radios them on the SAR

³⁴ Tony McPeak, “Gutsy Gunner,” *Misty: First Person Stories of the F-100 Misty Fast FACs in the Vietnam War*, Don Shepperd (ed.), 304.

³⁵ Bombs laid down in a linear pattern with a prescribed distance between each bomb are called a stick.

³⁶ Neel, 41.

³⁷ Chuck Turner, “Starting Up,” *Misty: First Person Stories of the F-100 Misty Fast FACs in the Vietnam War*, Don Shepperd (ed.), 61.

³⁸ Neel, 16.

³⁹ P.K. Robinson, “The Birth of Night Misty,” *Misty: First Person Stories of the F-100 Misty Fast FACs in the Vietnam War*, Don Shepperd (ed.), 200. Guard is the UHF emergency frequency 243.0

common frequency, finds out the downed aircrew's callsign, and begins to coordinate for the rescue effort. The large number of aircraft shot down in RP I has made SAR operations a common occurrence, but the crew's adrenaline level is up, nonetheless.

Crown confirms that an F-4, callsign Lion 32, has been shot down near the coast in the northern section of RP I. The remaining three aircraft are currently CAP-ing the survivors' location. Lion 31 informs Misty that his wingman was hit by AAA over a target 15 miles west of their current location. Lion 32 climbed out to the east, hoping to make it feet wet, but was forced to eject just prior to reaching the coast.⁴⁰ Lion 31 has a visual on both parachutes, which have settled about two hundred meters apart, 2 miles inland.

The fact that the F-4 was able to depart the target area and that the aircrew have landed fairly close to the shore bodes well for the rescue attempt. Misty follows the coast until visual the three circling F-4s. Lion 31 is able to talk Misty 11 onto the survivors' location before departing for the tanker. Crown now designates Misty 11 as the on-scene commander.

Misty 11 watches as one of the survivors gathers up his parachute. Guard frequency goes quiet as they disconnect their parachute beacons, one by one. Lion 32A (the front seater) is the first to come up on frequency. He reports that he is in good condition, is not visual with Lion 32B, and will be taking cover in a thicket 40 meters west of where he has landed. He also reports that he took some small arms fire while descending in his parachute, but is unhurt and has not seen any activity since landing.

⁴⁰ The chances for successful rescue over water are much greater than those over land. The North Vietnamese must launch Sampans (small boats) in order to reach a downed pilot. Sampans are fairly easy to spot and attack from the air, making it easier to secure the location until the helicopters arrive. The threat level for the rescue forces is likewise lower.

Crown passes a question from Lion 32A's personal survival information, something only he would know and remember even under duress. All aircrew must review their survival information before each mission. Misty 11 authenticates Lion 32A by asking him the question and forwards the answer to Crown for confirmation.

Misty 11 begins searching the area for AAA sites that will have to be suppressed before the rescue can take place. They update Crown on the status of the survivors and are informed that four A-1 Sandys have been launched and two sets of fighters have been diverted for the rescue effort.



Figure 16: A-1H/J Sandy sitting alert ⁴¹

The A-1 Sandy's job is to prepare the survivors and to secure their location for the arrival of the rescue helicopters. Misty FACs working RP I can usually get to a bailout

⁴¹ Note the CBU canisters and the fuze extenders ("daisy cutters") on the parent mounted Mk-82s.

site before Sandys on ground alert, can arrive on scene. Mistys can also help speed up the rescue by locating the survivors and then suppressing AAA in the area to help the Sandys work in close. The Sandys will further suppress any immediate threat to the survivors.⁴² Misty is concerned not only with AAA at the rescue site, but also any along the egress route for the Sandys and the H-3 Jolly Green rescue helicopters. After several low altitude passes, Misty 11 has located all the occupied AAA sites and begins working fighters onto those positions.

Misty 11 is encouraged to learn from Crown that Misty 21 is enroute. Misty 11 has just enough fuel to bring Misty 21 on board, show him the survivors' location, and brief him on the status of remaining AAA. By this time the second survivor, Lion 12B, is up on frequency. He reports that he is immobile, having broken a leg on landing. Misty 11 authenticates Lion 12B, before handing over on-scene command to Misty 21 and heading for the tanker.

By the time Misty 11 returns, the SAR has progressed nicely. Misty 21 has continued strikes on all known AAA sites and the Sandys have arrived. Sandy takes over on-scene command and begins a series of low altitude passes in an attempt to draw ground fire and determine the threat level. As Sandy prepares the survivors for pick-up, Misty 11 holds high above the scene as backup for Misty 21, should 21 call bingo.⁴³

Finally, Sandy lead is satisfied with the conditions and calls for Jolly. Two H-3 helicopters have been holding feet wet and now proceeds to the survivors' location. Sandy gives the helicopters vectors inbound and calls for Lion 12A and B to pop their flares. The first Jolly quickly picks up Lion 12A, however the second H-3 is forced to

⁴² Commando Sabre Operating Instruction 55-1, 5-3.

⁴³ Bingo is a codeword for low fuel. Calling bingo indicates Misty 21 will have to proceed to the tanker.

hover over the thicket where the survivor is lying as a PJ (enlisted pararescue specialist) descends on a hoist. The second pick-up takes over three minutes and the crew reports taking small arms fire from the south. The Sandys quickly descend to strafe North Vietnamese troops 100 meters south of the rescue scene. Finally, with Lion 12B and the PJ back on board, Jolly 2 turns east, escorted by the Sandys until it is feet wet. Misty 11 is now free to head home. Of all missions, none is as rewarding as a successful rescue.



Figure 17: HH-3 Jolly Green Helicopter

Return to Base

Misty 11 lands at Phu Cat 6 ½ hours after departure. Physically and mentally exhausted, the mission is still not over until the debrief is complete. Misty FAC debriefs actually generate the enemy order of battle for RP I, as little intelligence arrives from 7th AF in a timely fashion. Misty 11 debriefs intel on the master map, indicating new AAA sites, as well as the BDA on targets struck. The two pilots spend the next few hours

helping prepare for the next day, then grab a quick steak before heading to the Misty bar. Here they reenact the day's events for other Misty FACs over a mug or two of liquid refreshment before grabbing some sleep for the next day's mission.

Misty Effectiveness

Simply counting the number of strikes controlled or vehicles destroyed by Misty FACs does not adequately measure Misty effectiveness. The primary objective for Commando Sabre was the interdiction of North Vietnamese supplies. Clearly, the overall interdiction campaign failed in cutting off support to the Viet Cong, as well as in preventing the build up required for the Tet offensive. Misty FAC effectiveness was limited by both contextual and operational elements, which combined to prevent a more successful interdiction campaign.

Bad weather and the cover of darkness proved to be significant contextual variables in hampering Misty FAC Operations. The F-100F lacked all-weather capability, which ruled out a continuous presence. Misty FACs shut down the Ho Chi Minh Trail on good weather days, forcing the North Vietnamese off the roads. Though Misty FACs experimented with night operations, even using a primitive night vision device, the fact that strikers could not hit the targets that the Misty FACs located caused the night program to be discontinued.⁴⁴ The lack of 24/7 coverage allowed the North Vietnamese to adjust their operations, moving only under the cover of darkness or low ceilings. Through a series of well-concealed supply stations, the supplies slowly made their way down the trail. Misty FACs could decrease the efficiency of the North

⁴⁴ Chris Kellum, "Misty at Night," *Misty: First Person Stories of the F-100 Misty Fast FACs in the Vietnam War*, Don Shepperd (ed.), 271.

Vietnamese supply system, but they could not prevent supplies from reaching the Viet Cong.

The Rules of Engagement (ROE) handed down by the White House stand out as the greatest contextual limitation to interdiction operations. Bombing halts and pauses gave the North Vietnamese time to replenish supplies and adjust defenses. For example, Russian tankers unloading fuel at Haiphong Harbor were declared off limits to attack. This forced the more inefficient strafing of individual 50-gallon oil drums as they were then floated down river. Restrictions prevented the insertion of U.S. ground forces to cut the LOCs in southern North Vietnam and Laos. Further ROE implemented by 7th Air Force early in 1970 ruled out low altitude reconnaissance and strafing. While implemented to prevent Misty FACs from operating at treetop level, the restrictions resulted in fewer targets being located and destroyed.

Unguided weapons presented an operational limitation to strikers trying to destroy the small, hard targets that the Misty FACs located. Misty FACs seldom suffered from lack of targets, but were invariably short of both the quantity and quality of fighters needed to destroy them.

Even with these limitations, Misty FACing was still a more efficient method of interdiction than the previous method of diverting fighters to perform armed reconnaissance in RP I. When conditions were favorable, Misty FACs severed the flow of supplies along the Ho Chi Minh trail.

Conclusion

In Route Package I and southern Laos the USAF attacked North Vietnamese forces without the benefit of friendly ground troops to locate, identify, and target the enemy. This mission proved to be one of the most difficult and dangerous of the war. Still, the sense of accomplishment and esprit de corps shared by the small, elite Misty FAC unit contrasts starkly with the general frustration of the USAF experience in Vietnam. Other F-100 pilots, discouraged by the futility of bombing an unseen enemy, were recruited by Misty FACs with the promise that Misty missions made a difference. They were told they would see more action in a single sortie as a Misty FAC than they would in an entire tour of CAS missions in South Vietnam. Those who joined for this reason were not disappointed. Misty FACs detected the enemy where others could not. Although the unguided bombs of U.S. fighters lacked the precision to consistently destroy hardened targets, they were effective against soft-skinned vehicles in the open. When Misty FACs were airborne, the movement of supplies to the Viet Cong ground to a halt. Although the overall interdiction campaign, plagued by political restrictions and the lack of 24/7 coverage, was ultimately a failure, one cannot deny the success of Misty FAC daylight tactics.

Chapter 4

HISTORY OF ATTACKING FIELDDED FORCES: POST VIETNAM TO KOSOVO

From World War I to Vietnam, the definition of interdiction remained consistent. Based on Air Force Doctrine Document (AFDD) 1, *Air Force Basic Doctrine* of September, 1997, the definition of interdiction involved the destruction, disruption, diversion, or delaying of an enemy's surface military potential before it could be employed effectively against friendly forces.¹ While the 1997 edition is the latest version of Air Force Basic Doctrine as of this writing, an amended definition of air interdiction has evolved in the USAF due to the combat experience of Operation Allied Force over Kosovo in 1999. The latest edition of AFDD 2-1.3 *Counterland*, 27 August, 1999, expands the scope of air interdiction:

Air interdiction, to include both lethal and nonlethal systems, is employed to destroy, disrupt, divert, or delay the enemy's surface military potential before it can effectively engage friendly forces, *or otherwise achieve its objectives*. (emphasis not in original)²

The phrase "or otherwise achieve its objectives" acknowledges that airpower, as demonstrated over Kosovo, can be used to directly attack an army without the presence

¹Air Force Doctrine Document (AFDD)1. *Air Force Basic Doctrine*, September, 1997, 50.

or foreseeable presence of friendly ground forces. While the aerial attack of enemy ground forces is an old concept, the possibility of airpower achieving military objectives in lieu of ground action is a new and highly controversial idea.

This chapter reviews the post-Vietnam AirLand Battle doctrine developed during the 1980s, as well as the USAF experience in attacking the Iraqi Republican Guard in the Gulf War. It will then examine the events leading to the use of A-10 FACs over Kosovo in the direct attack of the Serbian 3rd Army. Finally, a brief history of A-10 operations in Allied Force is provided.

Just as after the Korean War, many of the lessons learned about air interdiction in Vietnam were lost, including the evolution of the Fast FAC mission as performed by the Misty FACs. The focus of the U.S. military turned once again toward Europe and the threat of invasion by the Soviet Union. During the late 70's and 80's the U.S. Army and Air Force worked to develop systems such as the Apache, Air Tactical Missile Systems (ATACMS), the A-10, and the Joint Surveillance Target Attack Radar System (JSTARS) in preparation to defeat the Red Army. AirLand Battle doctrine provided the joint vision for integrating air and land operations. Air interdiction was an essential element of AirLand Battle and a new term, Battlefield Air Interdiction (BAI), emerged to emphasize the interdiction of second-echelon ground forces moving towards, but not yet engaged with friendly ground forces.³ The high threat environment of Central Europe and the plethora of targets that would arise from a massive land battle limited the potential effectiveness of Fast FACs. The detection of rear echelon forces would be the responsibility of such systems as JSTARS—not a difficult task, considering the wave of

² Air Force Doctrine Document (AFDD) 2-1.3. *Counterland*, 27 August, 1999, 23.

Soviet armor anticipated thundering down the Fulda Gap. NATO aircrews studied X-ray, Yankee, and Zulu folders containing imagery and maps of the routes the Red Army would need to use.⁴ They likewise flew missions along the East German border, becoming familiar with the terrain over which they would have to fight.

The fall of the Berlin Wall in November of 1989 and the end of the Cold War left the U.S. victorious but lacking a Soviet threat on which to base its military force structure and AirLand Battle doctrine. As the U.S. began to dismantle its forces in Europe, the focus shifted abruptly to the Middle East and the August, 1990 Iraqi invasion of Kuwait.

ATTACKING THE REPUBLICAN GUARD

On 17 January, 1991 United States and coalition forces launched the Gulf War air offensive. Waves of aircraft flooded into Kuwait and Iraq, attacking key integrated air defense system nodes, airfields, command and control systems, nuclear/biological/chemical (NBC) sites, and electric plants.⁵ Daybreak of day one witnessed the commencement of attacks against Iraqi ground forces in Kuwait. Among the centers of gravity identified by General Norman Schwarzkopf, the U.S. Joint Forces Commander, were the seven elite Republican Guard divisions held in reserve along the Iraq-Kuwait border.⁶ While aerial attack continued against key strategic targets in Iraq, 75% of strike missions focused on the Iraqi ground forces in Kuwait.⁷

³ Tony McPeak,, "TACAIR Missions and the Fire Support Coordination Line" in *Air University Review*, (Maxwell Air Base, ALA, September-October 1985), 70.

⁴ X-ray, Yankee, and Zulu are the military pronunciation for the letters X, Y, and Z, respectively.

⁵ *Gulf War Air Power Survey Summary Report*, (Washington, D.C.: Government Printing Office [GPO], 1993), 12.

⁶ General Norman Schwarzkopf and Peter Petre, *It Doesn't Take a Hero*, (New York: Bantom, 1992), 371.

⁷ *GWAPS Summary Report*, 65.

The U.S. casualty rate for the U.S. ground invasion was predicted to be as high as fifteen thousand.⁸ Concern over this possibility prompted General Schwarzkopf to develop a strategy emphasizing the use of airpower prior to a ground battle in order to significantly reduce the size of the Iraqi army, its capability to maneuver, and its will to fight. This air-first strategy proved highly successful, with friendly casualty rates below even the most optimistic estimates. Friendly ground forces were able to achieve objectives ahead of schedule and against only limited Iraqi resistance. However, this aerial achievement was not accomplished without major modifications to existing tactics.

The Gulf War air offensive consisted of three phases, conducted nearly simultaneously. Phases I and II were directed against strategic and air superiority target sets including leadership, command and control facilities, NBC facilities, airfields, aircraft, and the integrated air defense system. Phase III laid out the air attack against Iraqi fielded forces. It called for the 50% attrition of Iraq's 5,000 pieces of dug-in armor and artillery prior to any ground offensive.⁹ In this phase, Schwarzkopf was most concerned with the three heavy divisions of the seven Republican Guard divisions along the Kuwait-Iraq border.¹⁰ These units were widely dispersed and well dug in with thousands of earthen berms protecting their T-72 tanks.¹¹ Their defenses included anti-aircraft artillery (AAA), infrared SA-13 surface-to-air-missiles (SAMs), and radar-guided SA-6 SAMs.

⁸Colin L. Powell with Joseph E. Persico, *My American Journey*, (New York: Random House, 1995), 498.

⁹*GWAPS Summary Report*, 48-51.

¹⁰Lieutenant Colonel William F. Andrews, *Airpower Against an Army: Challenge and Response in CENTAF's Duel with the Republican Army*, (Maxwell Air Force Base, Alabama: Air University Press, 1998), 14.

¹¹National Training Center Handbook 100-91, *The Iraqi Army: Organization and Tactics*, (Fort Irwin, Calif., 1991), 25-31.

Phase III required the unprecedented success of airpower against a fielded army.¹² Air planning chief Brigadier General Buster Glosson's briefing to Schwarzkopf in December, 1990 estimated the Republican Guard could be attrited to 50% in only five days, assuming 600 sorties a day.¹³ Air planners divided Kuwait and Iraq into a grid pattern of 30 nautical mile x 30 nautical mile squares known as "kill boxes". Strike aircraft were assigned individual kill boxes for armed reconnaissance in locating and destroying Iraqi forces.¹⁴ The task of attacking the elite Republican Guard fell to F-16s and B-52s, while A-10s were employed against the regular Iraqi divisions along the Kuwait-Saudi border.¹⁵

By the fifth day of Phase III, coalition air attacks against the Republican Guard had not achieved anywhere near the 50% attrition level expected by Schwarzkopf.¹⁶ Post-war analysis indicated that only 24-34% of Republican Guard heavy division armor was actually attrited during the entire 38 days of the air campaign.¹⁷ Glosson's 5-day estimate proved overly optimistic for two reasons. First, the number of sorties flown against the Republican Guard fell well short of 600 per day. A combination of initial emphasis on Phase I strategic operations, a reluctance to employ A-10s against positions protected by SA-6 SAMs, and unanticipated Scud-hunting missions reduced the number of sorties available to attack the Republican Guard. For the first 5 days, total strikes

¹²*GWAPS Summary Report*, 51.

¹³*Ibid.*, 49.

¹⁴*Gulf War Air Power Survey*, Vol. 5, (Washington, D.C.: Government Printing Office [GPO], 1993), pt. 1: 463-539.

¹⁵Andrews, 29. Air Force assets were not the only air assets attacking fielded forces. Carrier-based F-18s also did so but did not begin to attack the Republican Guard in earnest until a week after the air war had started.

¹⁶Lieutenant Colonel Christopher P. Weggeman, F-16 pilot with 388th TFW, flew the Killer Scout mission against the Republican guard. E-mail interview with author, 28 November 2000. The Army was concerned not only with armor but also with support assets such as artillery, mechanized infantry vehicles, support vehicles, ammunition supplies, and POL storage.

¹⁷*GWAPS Summary Report*, 106.

against Republican Guard units were constant at around 100 missions per day. By the end of day 10, a cumulative count of sorties against the Republican guard totaled 728 missions.¹⁸ Second, air attacks were not as effective as war-gaming analysis had predicted.¹⁹ U.S. Air Forces used medium altitude tactics to reduce the threat from Iraqi air defenses. While this greatly improved survivability, U.S. pilots were relatively unfamiliar with medium altitude tactics. Unforeseen difficulties with target identification, poor weather, and inaccuracies in delivering medium altitude munitions combined to reduce effectiveness.

Increasing the number of sorties against the Republican Guard solved the first issue. However, the tactical problem of how best to destroy a dug-in army remained. In response, the Joint Air Operations Center (JAOC) incorporated three changes to improve the efficiency of the operational air forces. The first tactic involved directing the unique firepower of the A-10 against exposed and vulnerable Republican Guard forces. On 27 February, Glosson instructed A-10 commanders to prepare an attack on the Republican Guard Tawakalna armored division.²⁰ Facing such a heavily defended force, A-10s flew 48 aircraft in 6 waves of eight-ship formations, instead of their usual two-ship tactics. Three days of such wing-sized attacks were mounted against the division. The Iraqis responded by stepping up their deception efforts and by digging their forces deeper into

¹⁸*Gulf War Air Power Survey*, Vol. 5, (Washington, D.C.: Government Printing Office [GPO], 1993), pt. 1: 463-539. The majority of these missions, 569, were flown by F-16s employing non-precision, free falling general purpose bombs, as well as older generation cluster bomb units, MK-20 Rockeye, CBU-52, and CBU-58. Battlefield effectiveness was below expectations, which led to concern over the high consumption rates of the more modern, armor-piercing CBU-87 during the first two weeks. "CENTAF TACC/NCO Log, January-February 1991" (U), 30 January 1991, 21. (Secret) Information extracted is unclassified.

¹⁹ Lieutenant Colonel Christopher P. Weggeman, F-16 pilot with 388th TFW flying the Killer Scout mission against the Republican guard, e-mail interview with author, 28 November 2000.

²⁰William L. Smallwood, *Warthog: Flying the A-10 in the Gulf War*, (Washington, D.C.: Brassey's, 1993), 123-24.

the desert sand. Though U.S. Army damage assessment was unable to determine the extent of the damage to the Tawakalna division, the lowered threat from the division's air defenses and the increased use of decoys were considered positive indicators.²¹

The second innovation was the introduction of "tank plinking." Targets would be located from medium altitude with infrared targeting pods and then attacked with laser guided-bombs.²² One of the greatest advantages of this method lay in the targeting pod video, which could clearly indicate the infrared contrast of Iraqi armor against the cold desert background.²³ This added to the ability to verify attacks and boosted BDA estimates.

The final tactical innovation introduced the "Killer Scouts." A squadron of OA-10 (Observation/Attack) FACs, A-10 aircraft manned single-ship armed reconnaissance and strike control missions in kill boxes in southern Kuwait. Due to the perceived threat from radar SAMs, however, no OA-10s were directed deep against the Republican Guard. Instead, F-16CG (Block 40s) from Hill Air Force Base began flying as Killer Scouts.²⁴ This mirrored the Misty FAC hunter-killer tactics of Vietnam and was renamed to avoid confusion with hunter-killer SEAD tactics being used by F-4G Wild Weasels and F-16s at the time. Killer Scouts would take off early and reconnoiter their assigned kill boxes. Upon identifying Iraqi positions, they would bring in F-16 strikers for the

²¹ Andrews, 44.

²² *GWAPS Summary Report*, 21, and Andrews, 54. F-111Fs developed the tactic using their Pave Tack laser designator. Lessons learned during a Desert Shield exercise had shown the potential for identifying and targeting armor from medium altitude. On 5 February, 2 F-111Fs successfully dropped two GBU-12s on revetted positions. Within 3 days, 50 sorties a night were devoted to tank plinking. Navy A-6Es began dropping a limited number of LGBs, as did F-15E crews. The F-15Es were limited by the number of LANTIRN pods and quickly developed buddy lasing techniques. Fred L. Frostic, *Air Campaign against the Iraqi Army in the Kuwaiti Theater of Operations*, Project Air Force (Santa Monica, Calif.: RAND, 1994).

²³ Andrews, 56.

²⁴ AFDD 2-1.3, 102. Counterland doctrine now incorporates the Killer Scout mission.

attack. Like the Misty FACs, the Killer Scouts carried a minimum munitions load to maximize endurance and were allocated sufficient air-refueling tankers to remain on station for much longer periods of time. This allowed them to become familiar with the territory and increased their situational awareness.

Along with identifying viable target areas for attack, they also assisted in the collection of BDA. The Killer Scouts relied on their own eyes, aided somewhat by binoculars for damage assessment. As with Vietnam, the F-16 strikers available to the Killer Scouts dropped unguided bombs from medium altitude. At medium altitude it was difficult to accurately evaluate the number of targets destroyed. While the Killer Scout role had its limitations, this innovation did allow the F-16s to more efficiently apply their resources against Iraqi fielded forces.

Following the Gulf War, the USAF remained deployed in the Middle East, maintaining no-fly zones over Iraq and responding to sporadic infringements by Saddam Hussein's remaining forces. Elsewhere, the dissolution of Yugoslavia and the ethnic cleansing of Muslims by Bosnian Serbs in April of 1992 led to U.S. military involvement with the UN peacekeeping force in Bosnia. Meanwhile, famine in war-torn Somalia brought a U.S. military presence to Mogadishu in December of 1992 until the hasty withdrawal of U.S. troops in May of 1994. In September of 1995, U.S. airpower was again needed, this time in Operation Deliberate Force, an eleven-day air campaign which included attacks on Bosnian Serb fielded forces to bring Serbia to accept the Dayton Peace Accord.²⁵ By the late 90's the U.S. and the rest of NATO were convinced of the

²⁵ Robert Owens (ed.), *Deliberate Force: A Case Study in Effective Air Campaigning*, (Maxwell Air Base, Ala: Air University Press, 2000), xvii.

effectiveness of airpower in coercing Serbian President Slobodan Milosevic. They believed a similar tactic might be needed to solve the growing unrest in Kosovo.

Kosovo: Direct Attack of the Serbian 3rd Army

Tensions between Belgrade and Kosovo increased during the late 1980s. Slobodan Milosevic used protests by minority Serbs residing in the majority Albanian province as the foundation for his Serbian nationalist platform and his subsequent rise to the Serbian presidency in 1987.²⁶ By 1989, Belgrade revoked Kosovo's status as an autonomous region and placed restrictions on land ownership and government jobs for Kosovar Albanians.²⁷ During the 1990's, Kosovar dissension spawned a series of both violent and non-violent protests.²⁸ Opposition rose in 1997 with the formation of a small group of lightly-armed guerilla fighters known as the Kosovo Liberation Army (KLA). In response to KLA ambushes of Serbian police in early 1998, Serbian forces conducted brutal retaliatory attacks against suspected KLA positions.²⁹ KLA support swelled within Kosovo and led to an escalation of KLA activity. In July of 1998, Serbian forces conducted a village-by-village search for KLA members, displacing over 200,000 Kosovars in the process.³⁰ The magnitude of the humanitarian crisis captured the attention of the international community.

²⁶ Noel Malcolm, *Kosovo: A Short History*. (New York: New York University Press, 1998), 341.

²⁷ Tim Judah, *Kosovo: War and Revenge*. (New Haven, CT.: Yale University Press, 2000), 62.

²⁸ For purposes of this discussion, Kosovar refers to Kosovar Albanians.

²⁹ William Buckley (ed.), *Kosovo: Contending Voices on Balkan Interventions*. (Grand Rapids, M.I.: William B. Eerdmans Publishing Co., 2000), 100. For purposes of this discussion Serbia and Serbian will be used to refer to those forces from the Federal Republic of Yugoslav. Likewise, Macedonia will be used to refer to the Former Yugoslav Republic of Macedonia.

³⁰ Judah, 171.



Figure 18: Serbia, Kosovo and Montenegro³¹

In response to the KLA and Serbian exchanges, the United Nations Security Council passed Resolution 1160 in March, and Resolution 1199 in September of 1998. The resolutions condemned Serbia's excessive use of force, established an arms embargo, and called for an immediate cease-fire and the introduction of international monitors.³² The latter demand was met in the cease-fire negotiated between U.S. envoys and Belgrade in October.³³

³¹ Unites States Central Intelligence Agency Map, Available on line: www.lib.utexas.edu/maps/europe/serbia_montenegro_pol_97.jpg, accessed 18 Nov, 2001.

³² United Nations, Security Council Resolution 1160 (1998), Available on-line: www.un.org/Docs/scres/1998/sres1160.htm. Accessed 15 Nov, 2001. United Nations, Security Council Resolution 1199(1998), Available on-line: www.un.org/Docs/scres/1998/sres1199.htm. Accessed 15 Nov, 2001.

³³ Dick Leurdijk and Dick Zandee, *Kosovo: From Crisis to Crisis*. (Burlington, VT: Ashgate Publishing Co, 2001), 34. Though the insertion of 2,000 Organization for Security and Cooperation in Europe (OSCE)

However, the massacre of 45 Kosovar Albanians at Racak on 19 January, 1999 quickly brought the cease-fire to an end.³⁴ Under threat of NATO air strikes, Serbian and Kosovar representatives were summoned to Rambouillet, France to negotiate a peace agreement.³⁵ The compromise included the key items of a NATO-led implementation force, the recognition of the international borders of the Former Republic of Yugoslavia (FRY, made up of Serbia, Montenegro, and Kosovo), and an interim 3-year agreement, after which a final settlement of Kosovo could be arranged.³⁶ The Kosovar delegation initially refused to agree unless reference was made to a future referendum to decide the fate of Kosovo. Under the threat of the withdrawal of international support, including financial and military aid to the KLA, they reluctantly signed on 18 March, 1999.³⁷ The Serbs, unwilling to accept a NATO-led military force within Kosovo, remained recalcitrant. In the face of diplomatic impasse, NATO air strikes were ordered to commence on 24 March.

Initial planning for NATO air strikes against Serbia began as early as June of 1998.³⁸ Targeting for the strikes focused on fixed command and control and military facilities in Kosovo, Montenegro, and Serbia. These targets were selected for a variety of reasons, foremost being the low risk of collateral damage.³⁹ The strikes were intended as the punishment portion of NATO's coercive carrot and stick strategy. The initial target

observers were agreed to, OSCE was never able to get that many into country before their withdrawal in March, 1999. U.S. State Department, *Erasing History: Ethnic Cleansing in Kosovo*. 6.

³⁴ Albert Schnabel and Ramesh Thakur (ed.), *Kosovo and the Challenge of Humanitarian Intervention: Selective Indignation, Collective Action, and International Citizenship*. (New York: United Nations University Press, 2000), 35.

³⁵ Judah, 195. While Serbia was threatened by the air strikes if they did not come to an agreement, Kosovars were threatened by the possibility of NATO leaving them to the mercy of the Serbs if they did not sign.

³⁶ *Ibid.*, 206.

³⁷ Ministry of Defence, *Kosovo: Lessons from the Crisis*, (London: The Stationery Office, 2000), 9.

³⁸ Paul Strickland, "USAF Aerospace-Power Doctrine: Decisive or Coercive?" *Aerospace Power Journal*, (Maxwell Air Force Base, AL, Fall 2000), 16.

list included only 100 targets.⁴⁰ Of these, only 50 were eventually approved by the North Atlantic Council, sufficient for only 2 or 3 nights of strikes.⁴¹ Hence, the constrained nature of the strikes reflected the overarching concern for maintaining consensus among the 19 NATO countries.

In February of 1999, in the midst of the Rambouillet talks, General Wesley Clark, Supreme Allied Commander Europe (SACEUR), became concerned over the prospect of increased ethnic cleansing operations by the Serbian Army within Kosovo once NATO air operations commenced. Two of NATO's stated military objectives involved dealing directly with the Serbian fielded forces: to deter further Serbian action against the Kosovars and to reduce the ability of the Serbian military to continue offensive operations against them.⁴² Clark ordered his Combined Forces Air Component Commander (CFACC), Air Force Lieutenant General Mike Short, to increase the scope of air planning to include direct attacks on the Serbian fielded forces in Kosovo. This planning did not include the insertion of U.S. ground troops, commensurate with President Clinton's public announcement that no U.S. troops would enter Kosovo until after a settlement was reached.

³⁹Ministry of Defence, *Kosovo: Lessons from the Crisis*, 34.

⁴⁰ Wesley Clark, *Waging Modern War*. (New York: PublicAffairs, 2001), 176.

⁴¹ Strickland, 21.

⁴² HQ/USAFE Initial Report. *The Air War over Serbia: Aerospace Power in Operation Allied Force*. 25 April, 2000, 9.



Figure 19: Kosovo⁴³

With the breakdown of the Rambouillet peace talks and subsequent withdrawal of international observers on 19 March, 1999, Serbian ground forces commenced the systematic expulsion of Kosovar Albanians from Kosovo, codenamed Operation Horseshoe.⁴⁴ Ethnic cleansing operations were stepped up once NATO bombing began, leaving several hundred thousand refugees to seek safety in Albania and Macedonia, or to flee to the foothills within Kosovo as internal refugees.

⁴³ United States Central Intelligence Agency Map, Available on line: www.lib.utexas.edu/maps/europe/kosovo_93.jpg, accessed 18 November 2001.

⁴⁴ United States Department of State, *Erasing History: Ethnic Cleansing in Kosovo*. May 1999, 6.

At 1900 Greenwich Mean Time on 24 March, 1999 NATO air forces began bombing Serbian targets.⁴⁵ These targets focused on Serbian IADS, military command and control nodes, and airfields and aircraft.⁴⁶ NATO commenced the war with 214 dedicated combat aircraft, 112 of which were from the United States.⁴⁷ Initial NATO strikes were met with minimal resistance from Serbian surface-to-air missiles and fighters. The primary response, rather, took place within Kosovo and was directed at the Kosovar population.

Concealed within the verdant, cloud covered valley of Kosovo were 40,000 soldiers of the Serbian 3rd Army equipped with hundreds of tanks, APCs and artillery pieces and interspersed among over a million Kosovars. In addition, a wall of mobile radar-guided surface-to-air missiles, man-portable missiles (MANPADS), and AAA, as well as a squadron of MiG 21 fighters protected the 3rd Army against NATO air forces.⁴⁸

In developing air plans against the Serbian 3rd Army, U.S. planners assumed air superiority and relied on Suppression of Enemy Air Defenses (SEAD) and electronic jamming assets to confuse and degrade the Serbian Integrated Air Defense System (IADS). Assuming strike aircraft could safely enter Kosovo, two tactical problems still remained: how to locate and identify the targets and how to successfully attack them while limiting collateral damage. A-10 Forward Air Controllers (FACs) trained in visual reconnaissance and air strike control were selected for the task.⁴⁹ A-10 FACs would search out targets identified by either Intelligence Surveillance and Reconnaissance (ISR)

⁴⁵ *AWOS Initial Report*, 15.

⁴⁶ Ministry of Defence, *Kosovo: Lessons from the Crisis*, 34.

⁴⁷ *AWOS Initial Report*, 16. By the end of the war the number of USAF aircraft alone would rise to over 500.

⁴⁸ R. Jeffrey Smith and William Drozdiak, *Anatomy of a Purge*, Washington Post, April 11, 1999, A1.

assets during pre-mission planning, or in real time by the Joint Surveillance Target Attack Radar System (JSTARS). Once targets were identified, the A-10 FACs would control strikes with available NATO fighters. These fighters ranged in strike capability from USAF F-15Es with laser-guided bombs to Italian AMXs with manual bombsights for their unguided, 500-lb bombs.

Responding to the rapidly deteriorating situation within Kosovo, General Clark ordered General Short to commence attacks on Serbian fielded forces on 30 March. While poor weather delayed the first successful strikes until 6 April, A-10 FACs would fly over 1000 missions controlling the skies over Kosovo until 9 June, 1999, when a peace agreement was reached.⁵⁰

History of A-10s in Kosovo

A-10s first flew over the Balkans in 1993 when NATO aircraft began conducting air operations over Bosnia. The 81st Fighter Squadron, based at Spangdahlem Air Base, Germany continually deployed to Aviano Air Base until 1997.⁵¹ The A-10s were the only Night Vision Goggle (NVG) fighter aircraft capable of providing both day and night CAS and airborne FAC coverage for UN and NATO ground forces. Only the U.S. had specially trained and combat ready airborne FACs. The other countries had only trained with NATO ground FACs or U.S. airborne FACs for their CAS missions. Eventually, F-16CG squadrons of the 31st Fighter Wing at Aviano were trained to use NVGs and

⁴⁹ Lt Col Phil M. Haun, A-10 unpublished war diary. F-16CG (Block 40) FACs with LANTIRN targeting pods were also used primarily as night FACs. FAC duties eventually expanded to include US Navy F-14s and Marine F/A-18D Hornets.

⁵⁰ Steven Lee Myers, "Serb Forces Under Attack as Weather Clears," *The New York Times*, 6 April, 1999. By this time, over 400,000 Kosovar Albanians had crossed over into Albania and Macedonia. Christopher Haave and Phil Haun (ed.), *A-10s over Kosovo*, (Maxwell Air Base, Ala: Air University Press, 2002), 23.

assumed most of the FAC duties over Bosnia. With the continual presence of A-10s in the Balkans no longer required, the 81st needed only to conduct yearly deployments to Aviano, thus remaining familiar with Balkan operations and providing FAC coverage when the 31st FW was deployed elsewhere.

In January, 1999 the 81st deployed 6 A-10s to replace an Aviano F-16CG squadron on a stateside deployment. With tensions rising in Kosovo following the Racak massacre, the A-10s were ordered to remain at Aviano and the squadron increased the number of aircraft to 15 by the commencement of NATO air strikes on 24 March.⁵²

⁵¹The 81st Fighter Squadron was relieved to some degree from the continual deployment to Aviano by other active, reserve, and guard A-10 units from 1993-97.

⁵² Haave, 15. The total number of A-10s continued to grow during the War reaching 23 aircraft with the 81st at Gioia Del Colle, Italy and an additional 18 Air Force Reserve aircraft at Trapani, Sicily.



Figure 20: Photo of combat loaded 81st A-10s refueling over Macedonia¹

A-10s were initially tasked only with providing Combat Search and Rescue (CSAR) for NATO aircrews. An A-10 pilot from the 81st Fighter Squadron was the mission commander for the dramatic rescue of an F-117 pilot shot down near Belgrade on the fourth night of strikes.² A-10s provided on-scene command, tracked the survivor's location, coordinated the rescue effort, and provided cover for rescue helicopters during

¹USAF Official photograph accessed online at www.af.mil/photos/fighters2.shtml, 9 Jan 02.

² Ibid., 42.

the ingress, survivor pick-up, and egress of enemy territory.³ A-10s went on to provide CSAR coverage for all NATO aircraft flying over Kosovo and Serbia, both day and night, throughout the war.

On 26 March, the 81st was notified by the Combined Air Operations Center (CAOC) at Vicenza, Italy to commence FAC missions on 30 March. While all NATO airstrikes to this point had taken place at night, a shortage of EA-6B Jammers and F-16CJ SEAD aircraft prevented adding FAC missions to the number of strike missions they were already supporting.⁴ Although initially short of airframes, NATO had sufficient aircrew to double turn SEAD aircraft in support of FAC missions during the day and strike missions at night. Launching from Aviano, A-10s began flying sorties of six to seven hours down the Adriatic, across Albania and up into Kosovo. Low level clouds over Kosovo prevented aerial attacks until 6 April, when A-10 FACs located and struck a Serbian truck park, followed by two more successful days of attacks against convoys of Serbian tanks and APCs.

³ SANDY was the callsign for A-1D Skyraiders that performed on-scene command of CSARs during Vietnam. A-10s continue to use the SANDY callsign to this day to signify the type mission being conducted.

⁴ Though there was a shortage of aircraft, there were enough aircrew available to turn the EA-6Bs and F-16CJs for day and night operations. All conventional fighter and bomber aircraft operating in Serbia or Kosovo were required to operate with jamming and SEAD support.



Figure 21: Serbian T-55 Destroyed by A-10 with AGM-65 Maverick

A-10s Move to Gioia Del Colle

The lengthy enroute time from Aviano to Kosovo reduced time on station and prevented double turning the jets for two daylight missions per day. Fifteen days into the war, the CAOC ordered the 81st FS to further deploy to an Italian Air Force base at Gioia Del Colle in southern Italy. Sortie duration could thus be cut by over one hour per sortie, increasing on-station time, allowing the jets to fly two daylight missions per day, and giving a much needed respite to pilots. On 11 April, 1999 the jets in Aviano were joined in the move to Gioia Del Colle by an additional three aircraft from Spangdahlem.⁵ Other NATO squadrons deployed to Gioia Del Colle included British GR-7 Harriers, Italian Tornados and F-104 Starfighters. The Harriers flew as strike aircraft for A-10 FACs on a daily basis and the proximity of operations made for a close working relationship.

⁵ An additional 5 aircraft from the 74th FS at Pope AFB, North Carolina arrived in late April with 5 aircraft, 9 pilots and 65 maintenance personnel to augment 81st FS operations.



Figure 22: Map of deployed A-10 locations during Allied Force



Figure 23: Photo of Harrier returned from Kosovo mission

A-10 FAC operations at Gioia commenced on 12 April within 24 hours of arrival. With the growing success of strikes against its 3rd Army, the Serbs increased their active air defenses. A-10 FACs began reporting barrage-fired AAA and surface-to-air missile launches. On 2 May, an A-10 lost an engine to an SA-14 infrared-guided surface-to-air missile and was forced to recover at Skopje Air Base, Macedonia. On 11 May, another A-10 was struck beneath the cockpit by a mobile surface-to-air missile. The missile failed to fuze, however, allowing the jet to recover to Gioia.



Figure 24: Photo of damaged A-10 at Skopje, Macedonia

FAC operations over Kosovo grew to include most of the day and half of the night. A-10s covered two four-hour daylight windows over Kosovo while maintaining four aircraft on CSAR alert for night operations. F-16 CGs provided some day FACing, as well as a 2-3 hour night window. The US Navy provided additional day FAC coverage, flying F-14s off the USS Theodore Roosevelt.⁶ Even more FACs were needed, however, to provide full 24/7 coverage over Kosovo. It was the Air National Guard that stepped in to create the 104th Expeditionary Operations Group. This rainbow-colored Expeditionary Operations Group from three different A-10 ANG units in Michigan, Massachusetts, and Idaho totaled 18 aircraft. By early May, the 104th had deployed to Trapani Air Base in western Sicily. While the lengthy trip from Trapani to the Area of Operations precluded the 104th from being able to double turn for day missions, they were able to cover a midday FAC window and then turn for late night missions.

Additionally, the 104th deployed 3 of their aircraft to Taszar, Hungary in mid-May to perform CSAR alert.⁷ This improved the response time for A-10s in the event of a shootdown over northern Serbia. The final aircraft to join the FAC mission was the US Marine F/A-18D, when a full squadron joined the 104th CSAR detachment at Taszar, Hungary and began flying over Kosovo by late May.

Late May also ushered in the apex for air attacks against Serb ground forces. Improved weather and a KLA offensive in western Kosovo forced the Serbian 3rd Army out hiding and made the Serbs especially vulnerable to NATO air attacks. NATO increased the number of FACs and strikers for near continuous daylight operations until combat operations ceased on 10 June, 1999. A-10s then remained on airborne and ground CAS alert until the end of June as Serbian forces departed and NATO occupation ground forces entered Kosovo.

⁶ Haave, 22.

⁷ Ibid., 43.

Chapter 5

A-10 FAC TACTICS

The decision to use A-10 forward air controllers as mission commanders for daytime strike missions over Kosovo was based on the need to locate and attack the Serbian 3rd Army without the aid of a friendly ground force. Along with over 40,000 troops, the Serbians deployed a sophisticated Integrated Air Defense System (IADS), including a squadron of MiG 21s, mobile SA-6 radar-guided missiles, hundreds of shoulder-launched Man Portable Air Defense Systems (MANPADS) and AAA.¹ In response, NATO manned continuous air-to-air CAPs (Combat Air Patrol) to keep the MiGs in their underground bunkers, while Suppression of Enemy Air Defense (SEAD) fighters carrying HARMs (High Speed Anti-Radiation Missiles) and Marine and Navy EA-6B radar jammers kept the SA-6s silent.² Restrictions to flight operations below 15,000 feet further decreased the threat from MANPADS and AAA. A-10 FACs led up to 40-ship packages into Kosovo, comprised of aircraft from ten NATO countries. The A-10 FACs searched and located targets from medium altitude, then attacked and controlled strikes by NATO fighters onto the Serbian armor, artillery, trucks and AAA.³

This chapter depicts an actual A-10 FAC mission in late April, 1999. It includes the essential mission elements of visual reconnaissance, strike control, and strike, all

¹ *AWOS, Initial Report*, 9.

² Phil Haun, "Airpower Versus a Fielded Army: A Construct for Air Operations in the 21st Century", *The Royal Air Force Air Power Review*, Winter 2001, 74.

³ Haave, 39.

conducted with extraordinary effort to minimize collateral damage to the hundreds of thousands of Kosovar refugees.

The first flight of the day, Cub 31, is scheduled to arrive on station in the eastern half of Kosovo, codenamed NBA, an hour after dawn.⁴ Unlike Misty FACs who flew two pilots in a single jet, the A-10 FACs fly single-seat in two-ship formations for additional mutual support and firepower. The mission commander, Cub 31, is a qualified forward air controller accompanied by his wingman, Cub 32. A total of four A-10 FAC 2-ships are required, two in the east and two in the west, to cover Kosovo for this three-hour vulnerability window. The Air Tasking Order (ATO) calls for three FAC packages during the day, followed by a single night vulnerability period to be controlled by F-16 FACs.⁵

In addition to being the FAC package mission commander, Cub 31 is assigned the duties of embedded Sandy.⁶ Should one of the aircraft in the package be shot down, Cub 31 will assume Combat Search and Rescue (CSAR) mission command. These duties are the same as those of the A-1 Sandys in Vietnam: locating and authenticating the survivor and suppressing any threat to the survivor or rescue helicopter. Other Sandys also escort the helicopter in and out of enemy territory. The insertion of Sandys into the FAC package reduces the response time by as much as two hours over the alternative of maintaining A-10 Sandys on strip alert.

⁴ The western half of Kosovo was codenamed NFL.

⁵ Haave, 40. The length and number of vulnerability periods increased as additional FACs, including Navy F-14s and Marine F/A-18Ds, arrived in theater.

⁶ Only Sandy qualified A-10 FACs were designated as embedded Sandys.

Intel has spent the night surfing classified websites in search of potential targets.⁷ They have prepared the daily “Hog Menu du Jour,” a folder which today is composed of five photographs of Serbian armor and artillery taken by U-2s and national satellites.⁸ An additional source of imagery comes from Tactical Reconnaissance (TACRECCE) photographs taken by GR-7 Harriers collocated with the A-10s at Gioia del Colle Air base in southeastern Italy.⁹ The physical proximity of the two units allows for promising photos to be expedited to the next A-10 before launch. Unfortunately, only one photo of the five is less than 12 hours old and none have been taken within the last 6 hours.¹⁰ Six hours is the threshold beyond which most FACs consider it unlikely the target will remain in place. While the Serbs tend to keep their vehicles stationary on a clear day, they will relocate them on overcast days and at night.

Cub 31 spends several minutes reviewing the frag order, including the SPINS (Special instructions) and the banners that accompany the ATO. Of particular interest are any changes to the Rules of Engagement (ROE). Altitude restrictions have remained fairly constant since the 14 April bombing of a refugee column. That incident has reduced to 5,000 feet the minimum altitude FACs may fly to positively identify targets.¹¹ What has changed are the restrictions to targets and the process for target approval. No-attack zones within 10 miles of the Macedonian border have created a sanctuary that Serbian armor has quickly taken advantage of.¹² Although strikers are still free to attack

⁷ Captain Larry Card, A-10 FAC 74th Fighter Squadron, Weapon Questionnaire Gioia Del Colle, Italy, June 1999.

⁸ Haave, 146.

⁹ Captain Chris Short, A-10 FAC 81st Fighter Squadron, Weapons Questionnaire Gioia Del Colle, Italy June 1999.

¹⁰ Captain “Itch” Callich, A-10 FAC, Weapons Questionnaire Gioia Del Colle, Italy June 1999.

¹¹ Ibid., 149.

¹² Haave 151.

armor, artillery, and AAA, concern over NATO cohesion in the face of another collateral damage incident means Cub must now get approval from the CAOC to attack any trucks.

Informed of the latest changes, Cub heads for the mass briefing room, an entire wall of which is dominated by a 1:50,000 scale map of Kosovo. On it are marked the latest updates on Serbian activity and NATO strikes from yesterday's missions. After the weather and intel briefings, Cub 31 quickly gives the other FACs the plan for the mission. Most of the information is already on the line-up cards, courtesy of the squadron's Mission Planning Cell (MPC). Coordination with other aircraft for this mission comes from Aviano Air Base in northern Italy, where the wing MPC has generated a mission data card. This includes all the aircraft call signs, frequencies, tanker times and tracks, and a plethora of deconfliction information required to coordinate so many aircraft within such a confined airspace.

An hour prior to takeoff, Cub 31 dons his flight gear and checks out a pair of 12-power space-stabilized binoculars.¹³ These binoculars are his primary means of positively identifying Serbian armor. Meeting his wingman at the duty desk, Cub 31 gets the tail number for his aircraft, and a final brief from the squadron supervisor before stepping to the jet.

A-10 and A-10 FAC Munitions Load

The A-10 "Warthog" is a great choice for a FAC aircraft for several reasons. The greatest advantage lies in its pilots, specifically trained in FAC, CAS, and CSAR missions. Most A-10 FACs have over one thousand hours in the airframe and have spent

¹³ The squadron also had Canon 15-power, space-stabilized binoculars, slightly larger than the 12-power binoculars. The squadron A-10 FACs were split down the middle on which they preferred to carry.

that time training to kill armies. The pilot is afforded exceptional visibility and an extensive communications suite of radios which provide UHF (including Have Quick II), VHF AM, and FM frequencies.¹⁴ The jet has excellent self-protection capabilities: an ALR-69 Radar Warning Receiver (RWR), the ALQ-131 Electronic Combat Measures (ECM) pod, 120 bundles of chaff, and 180 flares. In addition, the rugged, twin-engine jet was designed to take hits; it comes equipped with a redundant flight control system and a titanium armored cockpit.



Figure 25: A-10 FAC flying over Macedonia with full combat load

¹⁴ Have Quick II is a jam-resistant, frequency hopping UHF radio. In addition, the A-10 has a KY-58 secure radio for its UHF and FM radios.

The A-10 is a large fighter aircraft built around a 30mm, tank-killing Gatling Gun. With a total of eleven hardpoints on its wing, it can carry a wide variety of munitions. It also carries the Pave Penny Pod, a laser spot tracker that indicates in the Heads Up Display (HUD) the position on which a striker has trained its laser. This enables the FAC to confirm the target before strikers release their bombs. Although the A-10 is assigned primarily to daytime FACing over Kosovo, the jet is the first USAF fighter with a Night Vision Goggle (NVG) compatible cockpit. Its slow speed, for which it is often maligned, is a tremendous asset in the FAC role, allowing for longer, more accurate looks at targets than can be gained from faster aircraft.¹⁵ Also, the fuel efficiency of its bypass fan engines gives the jet up to 1 ½ hours of loiter time between refuelings. Such features have been critical to the success of A-10 FACs in locating Serbian positions.

The A-10's weapon load-out is custom built for the FAC mission. On the outside stations, stations 1 and 11, hang two AIM-9 (Air Interceptor Missile) heat-seeking missiles and the ALQ-131 ECM pod. The next inboard stations, 2 and 10, carry two rocket pods for a total of fourteen 2.75-inch Willie Pete (White Phosphorous) rockets.¹⁶ Willie Petes are the primary method of marking targets as their smoke is easily seen by the naked eye or through a targeting pod.¹⁷ Stations 3 and 9 boast two 500-lb., precision-guided AGM-65D (Air to Ground Missile) Maverick missiles. This infrared version of the missile locks onto the heat contrast between the target and its background. The long stand-off range and the 125-lb., shaped warhead make this fire-and-forget munition ideal

¹⁵ The A-10 has a top speed of 350 KIAS, compared to the more common 450 – 550 KIAS flown by other fighters.

¹⁶ Haave, 50.

against armor.¹⁸ The center stations 4, 5, 7, and 8 hold Mk-82 low drag, 500-lb. general purpose bombs configured with FMU-113 radar proximity fuzes.¹⁹ Detonation of the bomb at 10-25 feet above the ground enhances the fragmentation pattern and is more effective against mobile targets than an impact fuze. Internally, the seven-barrel GAU-8A Gatlin Gun carries over 1,100 armor-piercing and high explosive rounds.

Though an exceptionally well-constructed Close Air Support aircraft, the A-10 has its weaknesses. Designed for low altitude flight, the aircraft is underpowered at medium altitude. It also lacks the technical sophistication of a radar, a GPS navigational system, a datalink, and a targeting pod.²⁰ The jet has a high radar cross section that makes it easily detectable by enemy radars and its slow speed makes it susceptible to AAA and MANPADS at low altitude.

A-10 FAC Flight Profile

Upon takeoff from Gioia del Colle, Cub begins a turn to the east and climbs to Flight Level 190 (19,000 feet). The flight then contacts Magic, the NATO Airborne Early Warning (NAEW) aircraft responsible for airspace control over the Area of Responsibility (AOR).²¹ It takes 45 minutes to cross the Adriatic and reach the tanker track over central Macedonia where a KC-135 is already waiting. After topping off the jets, Cub turns north and contacts Moonbeam for the first of their two vulnerability windows.

¹⁷ Captain Richard Johnson, A-10 FAC 81st Fighter Squadron Weapons Questionnaire Gioia Del Colle, Italy, June 1999.

¹⁸ *Weapons File 1999*, 2-2.

¹⁹ Station 6 is the center line station, but cannot be used if 5 and 7 are loaded.

²⁰ The A-10 has now been upgraded with a GPS inertial navigational system.

²¹ NAEW looks similar to a U.S. AWACS, however NAEW does not have the manning, communications suite, or train to control mass strike packages as does AWACS.



Figure 26: A-10 FAC Flight Profile

Moonbeam relays the CAOC's top two target priorities and confirms that both the required F-16 CJ HARM shooters and EA-6B jammers are on station. Cub 31 plots a course to these targets and updates his search plan. The sky over the southern half of the border is clear, but low clouds to the north threaten to blanket the entire valley. Cub 31 arms his weapons, his flares, and his electronic self-protection systems as he approaches the border. He begins searching the foothills along the major LOCs as he proceeds to the two CAOC target areas. Finding nothing at these locations, he moves on to check out his preplanned targets, comparing the terrain with the target photographs. When these do not

pan out, Cub continues to expand his search for the remainder of his 45-minute vulnerability window, looking for any unusual signs which might indicate enemy activity.

Bear 11, another two-ship of A-10 FACs, checks in on frequency, taking over control of NBA as Cub heads for the second tanker. After refueling, the flight will return for a second vulnerability window. This sortie is scheduled for a total of 4.0 hours, of which 1:45 will be spent in Visual Reconnaissance/Strike Control (see Table 2 for an A-10 FAC mission profile).

A-10 FAC Mission Profile

April 1999

Reference Time (T Hour) --	Takeoff Time
T minus 2:00 --	Prepermission Briefing
T --	Takeoff
T – T+:45 --	Enroute to Macedonia tanker track
T+:45 – T+1:00 --	Refueling (4-5,000 lbs offload)
T+1:00 – T+1:45 --	Visual Reconnaissance /Strike Control
T+1:45 – T+2:15 --	Refueling (4-5,000 lbs offload)
T+2:15 – T+3:15 --	Visual Reconnaissance /Strike Control
T+3:15 – T+4:00 --	Return to base
Total Area Time	1:45
Total Flight Time	4:00

Table 2: A-10 Flight Profile

Threat Avoidance

The primary threat to the A-10 comes from heat-seeking MANPADS. Cub 31 limits this threat by remaining at 15,000 feet above ground level (AGL) to the maximum extent possible. When conducting lower altitude passes (5,000 – 10,000 feet) for target identification, he limits himself to one pass only and uses a combination of jinks and flares when climbing back up to altitude. Cub 32 trails a mile behind slightly above and offset from Cub 31. As a wingman, Cub 32's purpose in life is to provide mutual support by covering the lead and calling out all SAM launches.²² This is a difficult task in the case of MANPADS launches, as the missiles are extremely fast and their pencil thin smoke trail hard to see. Wingmen barely have time to call for flares before the missile zips through the flight.

As indicated before, one key to avoiding the hundreds of MANPADS spread throughout the Kosovo countryside is to limit the number of passes made on any given target. While this may seem commonsensical, the less obvious reason lies in the limitations of the aircraft. For the underpowered A-10, each pass bleeds off energy in terms of both altitude and airspeed. Diving attacks performed back-to-back leave the jet low and slow, vulnerable to attack during the climb back to altitude.

For SA-6 operators to get a kill they must lock up the aircraft with the tracking radar and then launch a missile, which homes in on the reflected radar energy bouncing off the aircraft. However, the threat from the SA-6 is greatly diminished by the presence of HARM shooters. An F-16CJ or German ECR Tornado SEAD aircraft can launch

²² Captain "Boo" Bullard, A-10 pilot 74th Fighter Squadron Weapons Questionnaire Gioia Del Colle, Italy, June 1999.

HARMs at the SA-6 radar while it is illuminating its target. So the dilemma for the operators becomes whether or not to target strikers and run the risk of being killed. For the most part, the SA-6s in Kosovo have remained silent.

SA-6 operators have been even more reluctant to fire missiles during the day, when the huge, white smoke plume from the launch and rocket motor creates a prominent trail straight back to the operator's location. One A-10 FAC, tongue in cheek, believes the biggest threat from an SA-6 launch is the potential for a mid-air collision of fighters in pursuit of the smoke trail, all vying for the kill. This has hardly been the case at night, however. Although an SA-6 launch is easy to see, its precise whereabouts have proven difficult to locate, even with targeting pods and NVGs.



Figure 27: Remains of a destroyed SA-6 launcher abandoned in Kosovo.

AAA is in abundance but easily avoided by staying above 5,000 feet. Most of the AAA is 37 mm or less, with only a few 57mm pieces and no radar-guided AAA in Kosovo. The only visible signs of AAA fire during the day are the small, white clouds that appear as shells explode below the jets. Given that, it is still difficult to locate the gun positions. Unlike nighttime operations, when tracers and muzzle flashes are evident, the use of muzzle flash guards on AAA barrels prevents the daytime sighting of all but the small, brown dust clouds generated as the rounds are fired. Even then, the A-10 FAC must be looking directly at the AAA pit when it is firing in order to see the dust kick up. Small arms, on the other hand, have a distinct red muzzle flash which is easily identifiable, particularly if they are fired from a shaded area. More than one Serbian infantry company has highlighted its position by recklessly firing at A-10s circling overhead.

Visual Reconnaissance and Target Identification

The most important quality of a good FAC is the ability to locate targets. A saying among the A-10 FACs is, "95% of tactics is simply finding the target." The same traits that it took to be a good Misty FAC are important to the A-10 FAC. First, it takes hours of visual reconnaissance to get sufficiently familiar with the area to begin to discern Serbian armor and artillery. Although Kosovo is 60 x 60 miles, the Serbian army operates in a relatively small area in and around the larger towns, along the major LOCs, and near the border. Learning where not to look streamlines the VR effort. Pre-mission

study of the reported Serbian positions helps determine where the focus of the day will be. If unsuccessful, the scope can then be increased to widen the search area.

The key to locating targets is knowing what indicators to look for. The first rule is to note anything unusual or out of place. Clues are as subtle as knowing that Kosovo farmers, when harvesting hay, produce several large bales of hay per field. A field with only one or two large, rectangular hay bales warrants closer inspection and may reveal a tank's main gun barrel protruding through the straw.²³ As the spring rains begin to subside and the ground begins to dry, the nighttime movement of the heavy military vehicles produces tracks in the grass. The soil is tan in color, leaving visible tracks in a tank's path. The tracks leading from an empty berm may be used to locate Serb armor hidden in a nearby barn or tree line. In forests, any shape with a 90-degree angle is suspicious. In addition, the Serbs, knowing A-10 FACs will not strike civilian vehicles, have begun using white buses for transporting troops. A bus parked near a stand of trees is a neon billboard to a smart FAC to begin a search of those woods. Though a trail leading to berms inside a stand of trees may seem well concealed, it actually stands out when viewed from directly overhead. Even Serbian Army barracks already destroyed by NATO bombs can be a lucrative location to start a search. The area may still be home to some of the Serbian soldiers and stray vehicles can be found in and near the compounds. Such insights and trade secrets are often exchanged between FACs at the squadron after a mission or at a restaurant over the evening meal.

Second, a disciplined scan pattern has to be developed, along with a proficiency in the use of binoculars. While aircraft vibration makes it difficult to focus high power binoculars, the introduction of commercially available, space-stabilized binoculars has

alleviated this problem. From 15,000 feet it is now possible for a skilled FAC to identify armor and even distinguish between tanks, APCs and self-propelled artillery. With the naked eye, he first selects an area of interest, then concentrates on a specific point for 3-4 seconds before moving to the next.²⁴ The binoculars are not used until a potential target has been located. Due to the narrow field of view of the binoculars, it takes practice for the FAC to be able to relocate the target while looking through the binoculars. He must first note a nearby prominent landmark to ease the transition before peering through the lens. Likewise, once a target is identified and before the binoculars are put down, the relationship between the target and the landmark is noted. More than one Serbian tank has escaped because the failure of a FAC to relocate it after lowering his binoculars.

One flight technique for reducing the slant range when viewing targets is to keep the jet in a 30-degree bank, this allows the pilot to search almost directly underneath the jet's flight path. As seen in the figure below, this reduces the slant range by over a mile in comparison to a level flight path.²⁵

²³ Dave Gross, "This Time It's Real," *A-10s over Kosovo*, Chris Haave (ed.), 71.

²⁴ Major Wade Thompson, A-10 FAC 81st Fighter Squadron Weapons Questionnaire Gioia Del Colle, Italy, June 1999.

²⁵ Captain James Meger, A-10 FAC 81st Fighter Squadron Weapons Questionnaire Gioia Del Colle, Italy, June 1999.

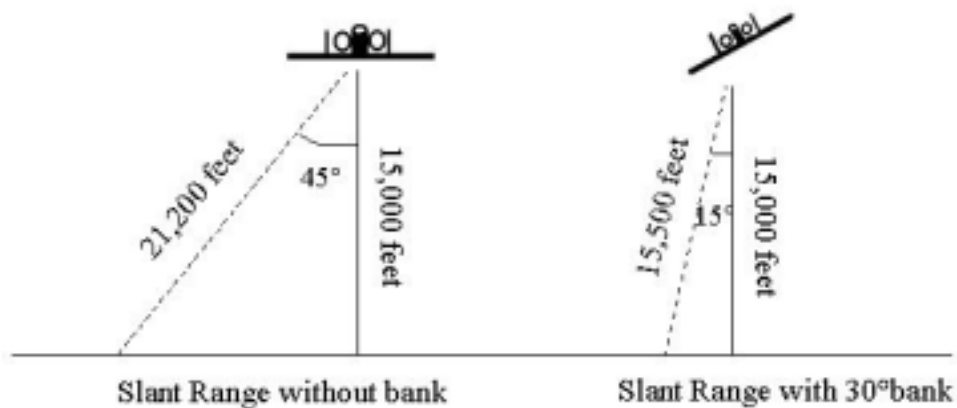


Figure 28: Decreasing VR slant range with bank angle¹

Finally, some FACs are simply better at finding targets than others. Good mission prep, a positive attitude, and keen vision seem to be common denominators of exceptional FACs. Even a highly skilled FAC can use the help of other assets, though, the most important of which are the Joint Surveillance Target Attack Radar System (JSTARS) and the USAF Predator Unmanned Aerial Vehicle (UAV).

JSTARS is a long range, air-to-ground surveillance system on board an E-8C, a modified Boeing 707. It consists of a Synthetic Aperture Radar (SAR), capable of producing a radar image of a selected area, and a Moving Target Indicator (MTI), designed to locate slow-moving ground targets. JSTARS has the unique capability of tracking hundreds of vehicles throughout Kosovo with its MTI, but lacks a viable onboard target identification system.² While JSTARS can see all the vehicles moving

¹The A-10's cockpit visibility allows for a downward 45° view angle in level flight.

² Major Pete Brotherton, A-10 FAC 81st Fighter Squadron, Weapons Questionnaire Gioia Del Colle, Italy, June 1999.

around Kosovo, it cannot distinguish a T-72 tank from a tractor pulling a trailer loaded with refugees.³ Collateral damage concerns, which dictate a visual target identification criterion, greatly reduce the potential utility of JSTARS in this conflict. To overcome this challenge, JSTARS has developed tactics to correlate its tracking data with positive target identification from UAVs and has, on occasion, been able to provide real time targeting information to FACs.



Figure 29: JSTARS

While UAVs such as the Predator have been used in the past for surveillance, they also show great promise in locating and identifying targets from low altitude without risk to pilots. Over Kosovo, Predators conduct surveillance and for the first time provide real time targeting information to the A-10 FACs flying overhead. The effectiveness of the tactics is somewhat limited by the lack of previous Predator experience with FAC

³ Phil Haun, *RAF Air Power Review*, 77.

procedures, making tasks such as altitude deconfliction and target talk-ons difficult.⁴ Although UAVs have never been fully integrated into the ATO with strike packages before, operational techniques have quickly been patched together to test their capabilities. Qualified ground FACs at the CAOC can now monitor the Predator's video and conduct target talk-ons directly with A-10 FACs overflying the target area.⁵

The occasions when such efforts have proven successful provide a glimpse into the real time use of UAV platforms with conventional strike aircraft. On one occasion, Moonbeam directed Uzi 11, an A-10 FAC flight, to a specific set of coordinates.⁶ Once there, they received a target talk-on from the CAOC's ground FAC to an L-shaped building. Given immediate permission to attack the building, they struck it with three 500-lb. bombs. Later, when Predator detected Serbian soldiers walking next to the building, the flight was directed to reattack the site.



Figure 30: RQ-1 Predator

⁴ Captain John Cherrey, A-10 AFAC 81st Fighter Squadron, Weapons Questionnaire Gioia Del Colle, Italy, June 1999.

⁵ Haave, 214.

⁶ 11 May, 1999. Mark Koechle, "Big Brother" *A-10s over Kosovo*, Chris Haave (ed.), 249.

Despite the aid of JSTARS and the Predator, the efforts of Serbian 3rd Army at concealment and deception continue to complicate target identification. The Serbs have placed their armor in such politically sensitive locations as next to churches and inside houses. They have also placed dozens of artillery and armor decoys throughout Kosovo to draw off NATO bombers. Although it is very difficult to tell the difference between real armor and decoys from altitude, the A-10 FACs have developed a few tactics to compensate. The simplest way to determine if a target is a decoy is to blow it up; if there is nothing left of the target afterwards, then it was a decoy.⁷ Still other decoys are conspicuous because of their location. If a tank is sitting out in the middle of a field in broad daylight, it is likely a decoy. Another telltale sign is the lack of any fresh track marks or other indications of recent vehicle movement in the area. Again, the only way to know for sure is to blow it up. The thought of wasting munitions, particularly expensive precision-guided weapons is disconcerting to most FACs. No one wants to make the mission report that they have just killed an inflatable tank decoy with a \$100,000 Maverick missile. Still, to pass up on a target simply because it looks too good to be true is self-defeating. There have been many instances of FACs taking a target for a decoy, only to be pleasantly surprised when it sends up a secondary explosion.

⁷ The Serbs also placed some antiquated tanks out in the open.. Since these were real tanks, it was impossible to distinguish them from more modern tanks from altitude.



Figure 31: Artillery Decoy

The FAC mission of Swine 01, ended in just such a discovery.⁸ Locating an incredulous ten artillery pieces, Swine directed British Harriers to drop a single Mk 83, 1,000-lb. bomb onto one of the “decoys.” When a massive explosion rose up from ammunition stored nearby the pit, Swine moved in for more kills, attacking and controlling the Harriers and some F-15Es for strikes on all the remaining pits.⁹

⁸ 7 June, 1999, 2 days prior to cease-fire.

⁹ The validity of the artillery pits was confirmed by the NATO Mission Effectiveness Assessment (MEA) team, which went to the location after the war and found the destroyed artillery. It was suggested by the team that the late date of the attack did not allow the Serbs enough time to remove the artillery before their departure from Kosovo.



Figure 32: Arty Destroyed by Swine 01

A-10 Strike Control

Once Cub 31 has identified a target as valid, he must determine what aircraft and weapons can best be used to attack it. Along with the weapons carried by his flight, there are also NATO fighters scheduled throughout the vulnerability window. These strikers have been given secondary targets on which to drop their bombs if the FAC does not find fresh targets.¹⁰ NATO strikers potentially available to Cub come from 9 different nations (see the table below).¹¹ The arsenal varies greatly from F-15E Strike Eagles carrying laser-guided bombs to Italian AMX fighters with neither precision munitions nor a computing weapons delivery system for the Mk-82s they do carry. Although B-2 and F-

¹⁰ These secondary targets, commonly called dump targets, include Serbian Army barracks, weapons storage bunkers, and other fixed Serbian military targets. By the end of the conflict, these targets had been obliterated.

¹¹ Germany did not provide strike aircraft but did send ECR Tornados for SEAD support.

18 aircraft carry the newest GPS munitions, these weapons are not made available to the FAC missions. Still, the majority of strikers are fully capable of hitting the targets assigned them. Unlike in Vietnam, where U.S. fighters had difficulty in killing the targets the Misty FACs located, once an A-10 FAC identifies a target, it can be destroyed.

NATO Strike Aircraft	
U.S.	A-10, F-16CG, F-15E, F-14, F-18, AV-8B, F/A-18D
France	Super Etendard, Jaguar
U.K.	GR-7 Harrier
Netherlands	F-16AM
Belgium	F-16A
Canada	CF-18
Spain	EF-18
Italy	Tornado IDS, AMX
Turkey	TF-16

Table 3: NATO Strike Aircraft¹²

The weapons to be used, then, depend upon the nature of the target found. Precision weapons, such as laser-guided bombs or the Maverick, are required against

¹² Haave, 41.

tanks, artillery, and AAA. These targets are either armored or protected by earthen berms and require a direct hit to be taken out. CBU and general purpose bombs are best used against soft-skinned vehicles and dispersed targets, such as troops in a tree line.

Returning for the second vulnerability window, Cub 31 finds that clouds have moved in, leaving only the southeastern part of NBA visible. Cub heads to the city of Gnjilane to begin a search of the surrounding foothills where there has been previous enemy activity. Locating a row of 8 freshly occupied artillery pits, he calls up Moonbeam, who quickly lines up a 2-ship of CF-18s, callsign Merc 11.¹³ The CF-18s are carrying 500-lb. laser-guided bombs (LGBs). Cub passes coordinates, gives them a target area update and begins a talk-on. “Call visual the factory that is just east of the huge town that is on the east-west hardball.” G-town (Gnjilane) is the only large town in eastern Kosovo. On the east side of G-town is an enormous factory complex next to the highway, leading east out of the town.

¹³ Haun, “A-10s over Kosovo”, *Flight Journal Magazine*, August 2001, 41. The following strike was flown by the author on 15 April, 1999.



Figure 33: Target area near Gnjilane

Merc 11 replies, “Copy. I see one factory. Large structure has a blue roof building to the west.” Merc 11 not only responds that he sees the factory, but he confirms it by giving a positive description of a distinct feature.

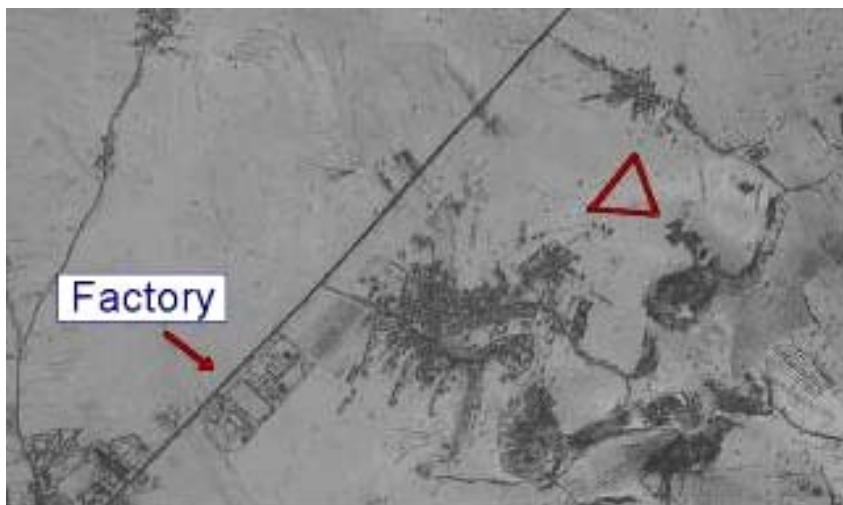


Figure 34: 1:5 meter imagery of Target Area

“That’s affirmative, let’s use that factory east-west one unit. From the eastern edge of factory go two... let’s make that three units east on hardball. Then use factory from hardball. You’ll see a pull-off on the north side of the hardball. Go one unit to the south off the hardball. In between two small towns you’ll see some light revetments.” Cub continues the talk-on by setting the length of the factory complex east to west as a unit. He treats that unit as a yardstick and measures the distance along the road to another feature (a pull-off). He talks Merc 11 down between two towns where the artillery is lying.

Merc 11 responds, “Copy light revetments, there appears to be 4 to the south and 4-5 to the north.” Merc 11 has the revetments in sight and again gives a description of what he sees. The revetments appear light due to the light sandy soil in this region of Kosovo in contrast to the darker green grass of the field where the revetments have been dug.

“Copy. That is affirmative. Say your laser code.” Cub wants the laser code to enter in his Pave Penny Pod to ensure Merc’s laser is actually pointed at the right target.

“Laser code is 1633.”

Merc is ready to attack and extends to the southeast some ten miles from the target for his run in. Cub clears Merc to drop when he calls inbound. Merc shacks (directly hits) the artillery piece. He sets up for a subsequent attack and takes out another piece before running low on fuel and departing.

In the meantime, Dragon 61, a 2-ship of F-15Es checks in carrying 500-lb. LGBs as well. Dragon locks up Cub with his air-to-air radar. Dragon is to call when he is visual Cub, a fairly easy task, as a 2-ship of A-10s circling a target looks like a pair of large Xs in the sky. Dragon calls visual and Cub rolls in to mark, this time with Willy Pete rockets. He shoots three rockets, expecting to get them to blossom into small white phosphorus clouds near the target. As long as Dragon is watching the general target area he will easily see the smoke generated by the rockets.

With the A-10’s computing weapons delivery system, an accurate rocket can be shot from as far off as 4 miles slant range. This allows Cub to recover well above 10,000 feet. He shoots multiple rockets in case one is a dud. He can also refer to the distance between the rockets as an additional unit of measure, if necessary. In this case, though, the rockets land next to the arty pits.

Dragon 61 confirms the smokes, “61 is contact two smokes.”

“Copy. Look at the further northeast smoke. It’s sitting just on the east side of four arty pits south of a road.” Even though the smokes are visible, the arty pits are so small that Cub has to ensure Dragon has them in sight.

Dragon calls contact the target area. Cub is starting to run low on fuel and wants to get the F-15Es dropping as soon as possible. Dragon is not a FAC and therefore not authorized to pick his own target to drop on. He can, however, continue an attack once Cub gives him permission. Cub passes Dragon control of the targets. “You have flight lead control on that target area. I’d like [you] to take out as many of the arty sites [as you can] at that position. Two have already been struck. Those are two just north of the east-west road.”

Cub 31 departs for the tanker and Dragon continues his attack, destroying an additional three artillery pieces. Heading home, Cub 31 contacts Moonbeam and passes on the BDA for his flight and the fighters he has controlled.



Figure 35: Serbian Artillery Piece Destroyed by F-15E controlled by A-10 FAC¹

¹ This artillery piece was destroyed on 7 June 99, by an F-15E’s laser-guided bomb. The target was located and the F-15Es controlled by an A-10 FAC.

Not all attacks run so smoothly. In this case, these artillery pits were found in an open field with little risk of collateral damage. Also, there were no AAA or MANPADS launches seen, although the area is known for having active air defenses. Likewise, two sets of precision bomb dropping strikers were readily available, both of which were manned by native English speakers. Though the official language for NATO is English, there is a considerable range of language skills among pilots, with particular difficulties for those from nations such as Turkey and France.²

A-10 Strike

An advantage that Cub 31 has over Misty is the large number of munitions that he and his wingman carry. This gives Cub the option of destroying targets without having to call in strikers, a capability especially useful against fleeting targets. Although, for the most part, the Serbs do not move their vehicles under clear skies, an occasional mobile APC or tank will be spotted. Other fleeting targets include those in areas where cloud cover is beginning to form. The weather over Kosovo for much of April has been chronically disruptive to strikes. In this case, there may not be time to bring in other fighters before the hole in the clouds closes up. This added flexibility for A-10 FACs has proven a great asset.

Against armor, the weapon of choice is the AGM-65 Maverick. As long as there is good heat contrast, Cub can fire this 500-lb. air-to-surface missile from 3-4 miles out.³

² Pilots from Germany, Belgium, and the Netherlands have little difficulty with English since most already have excellent English skills and many have been through pilot training in the United States.

³ Captain James Meger, A-10 FAC 81st Fighter Squadron Weapons Questionnaire, Gioia Del Colle, Italy, June 1999.

The Maverick, while good at killing armor, does not make for a good mark. Too often, Cub has to come off target dry (without firing) because of inadequate contrast. Also, unless the strike produces secondary explosions, the fighters will not be able to see the impact. Cub therefore reserves his Mavericks for armor and other precision deliveries, such as those against dug-in artillery pieces.



Figure 36: A-10 firing an AGM-65 Maverick

The four Mk-82 airburst bombs that Cub carries are excellent against soft targets. With the computing sight on board, the bombs can be delivered very accurately, even against individual vehicles. They can also be used as marks, adding killing power beyond that of a rocket.⁴ However, the cloud generated from a Mk-82 dissipates rapidly and, unless a fighter is looking directly at the target area at impact, he will likely miss the

⁴ Captain John Cherrey, A-10 FAC 81st Fighter Squadron Weapons Questionnaire, Gioia Del Colle, Italy, June 1999.

mark. Also, the bomb cloud is darker, providing less contrast than that of a Willie Pete mark.

The last weapon available to Cub is the 30mm gun, which he uses as his tertiary weapon. As an embedded Sandy, he must reserve half of the rounds for use in case a rescue is required. Also, the extreme slant ranges required at medium altitude greatly reduce the gun's armor killing potential.⁵ To enhance its effectiveness, Cub must descend to below 10,000 feet. Given the shortage of targets and the wide availability of other weapons, he rarely resorts to the gun.

Return to Base

Cub lands at Gioia del Colle 4.0 hours after departure. Upon landing, the pilots head straight to intel. Cub 31 goes to the briefing map and points out all the target areas identified and those attacked. The next set of A-10 FACs are just arriving for their briefing, allowing Cub 31 to take the mission commander aside for an update on the weather in Kosovo and likely target areas.⁶ Next, Cub 31 and 32 must review their HUD videotapes and answer any additional questions for the intel mission report. Cub 31 then debriefs his wingman over a sandwich before heading to the hotel for their 12-hour crew rest for tomorrow's mission.

A-10 FAC Effectiveness

Measuring the effectiveness of A-10 FAC operations is difficult. Clearly, NATO strikes failed to prevent Serbian ground forces from conducting widespread ethnic

⁵ Captain Michael Shenk, A-10 FAC 81st Fighter Squadron Weapons Questionnaire Gioia Del Colle, Italy, June 1999.

⁶ Captain Joseph Brosious, A-10 FAC 81st Fighter Squadron Weapons Questionnaire Gioia Del Colle, Italy, June 1999.

cleansing operations against Kosovar Albanians. In fact, the majority of Serbian atrocities occurred prior to the start of A-10 FAC operations.⁷ Other critics claim the attacks against the Serbian 3rd Army had only a marginal impact on Slobodan Milosevic's decision to capitulate. They point instead to other factors, such as strategic strikes on Belgrade, the withdrawal of Russian political support, and even the remote threat of a NATO ground invasion.⁸ Still others assess the direct attacks as inefficient. One senior Air Force officer estimated that as many as 15 sorties were required to kill a single Serbian tank.⁹ However, others have pointed to desertions by Serbian soldiers and to civilian demonstrations against the deployment of further army reserve units to Kosovo as evidence of the influence the attacks against the Serb 3rd army was having on Serbia.¹⁰

Yet, A-10 FACs were indeed successful in keeping the Serbian 3rd Army from using its armor to conduct ethnic cleansing operations. In order to empty a village, the standard operating procedure of the Serbian Army had been to take a company of tanks and form a wide horseshoe around the village, with the opening of the horseshoe pointed toward the nearest border.¹¹ Serbian para-military police would then enter the village and grant the villagers as little as 30 minutes to leave their homes with whatever possessions they could manage to take with them. The introduction of A-10 FACs stopped the use of these tactics. The Serbs had to hide during the day and disperse their equipment to avoid detection. The threat from A-10s circling overhead forced the Serbs into a defensive

⁷ *Air War Over Serbia, Initial Report*, 15.

⁸ Daniel Byman, "Kosovo and the Great Air Power Debate," (International Security, Vol. 24, Spring 2000), 5.

⁹ U.S. General Accounting Office, *Kosovo Air Operations: Need to Maintain Alliance Cohesion Resulted in Doctrinal Departures*, July, 2001, GAO-01-784, 11.

¹⁰ "Kosovo and Around It: Bargaining Goes On," *Belgrade BETA*, 20 May 1999.

¹¹ The Serbian ethnic cleansing operations of January, 1999, Operation Horseshoe, was so called because of the characteristic formation of Serbian armor.

posture, slowing their daytime movements and reducing the effectiveness of subsequent attacks on Kosovar civilians.

Unfortunately, the Serbs adapted by using civilian vehicles to continue their attacks. While A-10 FACs had the ability to keep the roads clear of all vehicle movement, NATO's concern over collateral damage prevented such strikes. The 14 April attack on a Kosovar refugee column by NATO fighters made the situation particularly tense. Serbian soldiers were free to jump out of their APCs and into Kosovar Albanian's abandoned Yugos to continue their operations. The requirement for positive identification of all vehicles severely restricted the use of JSTARS, as well as all nocturnal FAC operations. While FACs using NVGs and targeting pods could locate moving vehicles, these night devices lacked the clarity required for positive target identification. Unlike Vietnam, when fighters found it impossible to hit targets at night, U.S. fighters over Kosovo had the capability to destroy targets but lacked the permission to do so.

In addition to target ID requirements, theater ROE also restricted most NATO aircraft to above 15,000 feet. This meant that cloud decks over Kosovo could be no lower than 20,000 feet for A-10 FACs to operate.¹² As the campaign progressed, the poor weather of late March and early April gave way to blue skies in late April and May. This granted A-10 FACs more coverage time, greatly increasing the number of targets identified and attacked. Likewise, the number of Serbian claims of collateral damage began to rise. In response the CAOC systematically wrested control authority away from

¹² Although A-10 FACs could operate below lower clouds, the necessity for SEAD and Jammers on station increased the minimum weather ceiling.

the FACs. By June, FACs were forced to seek clearance for attack on each target acquired.

The refusal of U.S. political leadership to deploy ground forces further complicated matters. This freed Serbian forces to defend almost exclusively against attack from the air. Serbian armor, which would have been lined up to protect entry routes from Albania and Macedonia, was instead dispersed throughout Kosovo. This lack of a ground threat greatly vexed the air campaign, making the A-10 FAC mission all the harder. A-10 FACs did take advantage of the Kosovo Liberation Army's offensive in Western Kosovo which forced Serbian forces out of hiding. Though the KLA was soundly defeated, the Serbs suffered mounting losses from NATO strikes just days before Milosevic capitulated.

The final critique of A-10 FAC operations lies in the assessment of attrition to the Serbian 3rd Army during the 78-day air campaign. However, producing an accurate assessment proved just as problematic as locating and identifying Serbian armor. Unlike Desert Storm mission objectives, which called for a 50% attrition of Iraqi armor, no such quantitative objective was ever set for Kosovo. Furthermore, the total number of Serbian armored vehicles in Kosovo was never well tracked, leaving no way for NATO intelligence to adequately assess attrition rates, even if that had been an objective.

The question of BDA count was not raised until after the war when the press filmed the Serbian 3rd Army as it withdrew from Kosovo. The measure of effectiveness of the air attacks was then reduced to the question of how much armor was destroyed. In a September, 1999 NATO news conference, General Clark was asked how much of the

3rd Army was destroyed, to which he simply replied, “Enough.”¹³ This alludes to the fact that NATO air strikes against the Serbs in Kosovo were designed for coercion, not attrition. Two of NATO’s objectives were those of deterring Serbian action against the Kosovar Albanians and of reducing the ability of the Serbian military to continue offensive operations. The success in meeting these objectives was measured not by the number of vehicles destroyed, but by the action of the Serbs. In the end, the Serbs conceded to NATO demands and withdrew from Kosovo.

Nonetheless, the fact remains that the primary target of NATO warplanes over Kosovo was the 3rd Army’s armor and artillery. It seems reasonable that an accurate BDA would shed light upon the effectiveness of attacking fielded forces at the tactical level. Unfortunately, BDA has been clouded by controversy since the final day of strikes. The following table reflects the BDA reported from several sources. Regardless of which set of numbers are closest to being accurate, having an accurate number/percentage of vehicles destroyed is meaningless without a yardstick to measure overall effectiveness.

BDA Source	Tanks	APCs	Artillery
Shelton, 10 June 99	120	220	450
Serbian, 16 June 99	13	6	27
Newsweek 15 May 00	14	18	20
NATO, 16 Sep 99	93	153	389

Table 4: Allied Force Tactical BDA estimates¹⁴

¹³ Wesley Clark, General (USA) and John Corley, Brig General (USAF) at NATO press conference, Brussels, 16 Sep 1999. www.eucom.mil/operations/af/nato/1999/meabriefing.html, accessed 24 Feb, 2002.

¹⁴ Secretary of Defense, William Cohen, and Chairman of the Joint Chiefs of Staff, General Henry Shelton, provided an initial BDA assessment in a 10 June, 1999 briefing. Henry H. Shelton, Chairman Joint Chief

Conclusion

The intent of this chapter has been to depict a typical A-10 FAC sortie from briefing to debrief. The tactics used by A-10 FACs have been followed from visual reconnaissance to strike control to target attack. Though fewer than forty A-10 aircraft were flown over Kosovo, they became the focal point of NATO attacks against the Serbian 3rd Army. With limited imagery, JSTARS hampered by ROE, and Predator integration in its infancy, A-10 FACs were forced to rely on their own skill and cunning at finding targets, as did the Misty FACs before them. As in North Vietnam, U.S. ground forces were prevented from entering Kosovo to assist in locating and identifying the enemy. The difficulty of positively identifying camouflaged military equipment from 15,000 feet, along with the restrictions on which the targets could be struck, further complicated this already complex mission. Though helpless in keeping the Serbs from systematically expelling Kosovars from their homes, A-10 FACs did stop the Serbs from using their military equipment to do so and ate away at the 3rd Army's combat capability, as well as the Army's political support for Milosevic's ethnic cleansing campaign.

The A-10 proved an excellent platform for conducting daylight FAC operations over Kosovo. Trained in the use of space-stabilized binoculars, A-10 pilots could reliably distinguish civilian from military vehicles, isolate valid targets, and control a

of Staff briefing, Washington, DC: www.defenselink.mil/news/Jun1999/t06101999_t0610asd.html. 10 June, 1999. These numbers were refuted by a much lower total given on 16 June, 1999 by Serb Army Lieutenant General Nebojsa Pavkovic. Rebecca Grant, "True Blue: The Real Story Behind the Kosovo Numbers Game," AFA Issue Brief, 1 June, 2000. www.afa.org/library/issues/trueblue.html. By mid-July, General Clark ordered an Air Force Mission Effectiveness Analysis (MEA) team to go see what was on the ground. General Clark then gave NATO's BDA assessment on 16 Sep, which was similar to Cohen and Shelton's assessment. The numbers are slightly lower because of multiple strikes, which had previously been double counted. Wesley Clark, General (USA), and John Corley, Brig General (USAF), at NATO press conference, Brussels, Belgium, 16 Sep, 1999.

plethora of NATO strikers.¹⁵ The large quantity and variety of weapons aboard the airframe itself insured that targets meeting the stringent ROE were attacked and destroyed.

¹⁵ Marty McDonough, "The Call Sign was Cub 31," *A-10s over Kosovo*, Chris Haave (ed.), 180. This is evidenced by the 14 April attack on the Kosovar refugee column by F-16CJ FACs. The CAOC called upon A-10 FACs to verify the targets as military. Upon finding tractors and refugees near the destroyed vehicles, the FACs promptly called off the attack.

CHAPTER 6

CONCLUSION

Since World War II, the U.S. has been involved in several limited conflicts, against smaller, far less militarily capable opponents. Unlimited war with the Soviet Union, for which the USAF prepared over 40 years, never materialized. Instead, U.S. airpower has been directed against underdeveloped, authoritarian states. Such regimes tend to rely upon their armies as their primary source of power. Yet the USAF, born out of the aerial combat experience of World War II, has firmly held to airpower as the means of bypassing military forces and striking directly at the vital center of the enemy. Thus, American airmen are predisposed to discount the effectiveness of air attack against fielded forces. The realities of combat, however, have dictated the need for airpower to directly attack enemy armies without the presence of friendly ground forces. Airmen with little training and doctrine have often had to improvise tactics to fight the war with the resources at hand. This study examined two such groups of airmen in the Misty FACs of Vietnam from 1967-70 and the A-10 FACs over Kosovo in 1999. In both cases, the USAF failed to develop suitable tactics for the direct attack of enemy fielded forces.

Misty FAC in Vietnam

In the summer of 1965, President Lyndon Johnson became disillusioned with the Rolling Thunder air campaign. The graduated air strikes against North Vietnam failed to force Hanoi to withdraw its support from the Viet Cong in the South.¹ Johnson's

¹ Mark Clodfelter, *The Limits of Air Power: The American Bombing of North Vietnam*, (New York: The Free Press, 1989), 60.

emphasis instead shifted to ground operations within South Vietnam.² The importance of close air support and the interdiction of supplies to the Viet Cong was elevated. However, restrictions on lucrative interdiction targets in and around Hanoi and Haiphong Harbor were not lifted.³ Instead, the USAF was forced to interdict supplies in a piecemeal fashion as they were transported along the Ho Chi Minh Trail.

By early 1967, the efforts of USAF Forward Air Controllers, flying slow moving, propeller-driven aircraft during the day and AC-47 gunships at night, noticeably reduced the supplies to the Viet Cong. The North Vietnamese responded to this effort with anti-aircraft guns and SAMs, placing them far south into Route Package I. This forced the USAF to stop further FAC operations north of the border. In May of 1967, 7th Air Force launched Operation Commando Sabre, sending the two-seater F-100F “Hun” into Route Package I and Laos on single-ship visual reconnaissance and air strike control missions.

Under the call sign of Misty, these Fast FACs carried out their daylight missions under the constant threat of North Vietnamese AAA. Their 4- to 5- hour sorties were exceptionally dangerous with loss rates three times as high as those of other F-100 missions.⁴ With limited intelligence support, Misty FACs conducted visual reconnaissance of the LOCs and AAA positions and generated their own intelligence on the enemy order of battle. It was the experience gained over RP I which enabled Misty FACs to locate targets which other pilots could not.

Misty FACs then controlled fighters onto the targets they found. Using simple, manual bombsights to drop unguided bombs, the strikers were often effective against

² John Schlight, *The War in South Vietnam: The Years of the Offensive 1965-1968*, (Washington: Office of Air Force History, 1988), 33.

³ William Momyer, *Air Power in Three Wars: WWII, Korea, Vietnam, reprint*, (Washington: Office of Air Force History, 1985), 184.

such soft targets as trucks, but lacked the accuracy to take out the hardened AAA sites. In search and rescue operations, Mistys' indepth knowledge of air defenses in RP I and their skill in strike control allowed them to suppress enemy ground fire (in support of A-1 Sandys and H-3 Jolly Green rescue helicopters).

The North Vietnamese responded to the Misty FACs by hiding their vehicles during the day and moving only under the cover of clouds and darkness. Commando Sabre operations shut down daytime traffic in southern North Vietnam until the bombing halt of November, 1968 and then in Laos until May of 1970. At that point, a shortage of jets and experienced pilots and the impending withdrawal of F-100 units, led to the termination of the program. However, the overall success of the Misty program was recognized by 7th Air Force in its decision to continue Fast FAC operations with the F-4 Phantom until the end of the war.

A-10 FACs in Kosovo

On 24 March,1999 NATO commenced air strikes against Serbian military posts and command and control facilities in an attempt to force Yugoslav President Slobodan Milosevic to accept the Rambouillet Peace agreement. Milosevic responded by accelerating ethnic cleansing operations in Kosovo. Within days, hundreds of thousands of Kosovar Albanians had abandoned their homes and overwhelmed the borders. Under intense political pressure to stop the ethnic cleansing, Supreme Allied Commander, General Wesley Clark, ordered air strikes against Serbian fielded forces in Kosovo.

The high risk of collateral damage arising from the close proximity of Serbian troops to Kosovar refugees compelled NATO to adopt stringent positive target

⁴ History of 37th TFW, Jan-Mar 69, volume II, 21.

identification criterion. The use of airpower was further complicated by restrictive rules of engagement and the lethal threat of Serbian MANPADS and AAA, which kept aircraft above 15,000 feet.⁵ When President Clinton publicly ruled out the use of U.S. ground troops, the Serbian 3rd Army freely dispersed its forces throughout the country as it no longer had to worry about defending the borders from a NATO ground invasion. Finally, poor weather over Kosovo continued to impede U.S. air strikes through mid April.

The mission of attacking the Serbian 3rd Army was assigned to A-10 FACs, who served as mission commanders for day strike packages.⁶ Protected from Serbian SA-6s and MiG 21s by SEAD and air-to-air CAPs, the A-10s circled over Kosovo, locating Serbian positions with space-stabilized binoculars.⁷ The heavily armed A-10s then attacked and controlled NATO fighter attacks on Serbian armor and artillery. Unlike Vietnam, the targets that the A-10 FACs identified were easily destroyed with a variety of precision-guided weapons, as well as with freefall munitions dropped with the aid of highly accurate computing bombsights.

A-10 FACs received little intelligence from higher headquarters to aid in operations.⁸ Imagery was often outdated by the time it reached pilots. Despite the capability of JSTARS to track vehicles with its all-weather moving target indicator, it was unable to differentiate tanks from tractors. While Predator UAVs could identify individual targets, they had never previously trained with FACs, making them difficult to

⁵ This restriction was later relaxed to allow lower altitudes for conducting visual reconnaissance or diving weapons delivery passes.

⁶ F-16 CG FACs served as the primary night FACs, because of their targeting pods.

⁷ Serbian targets included a wide range of equipment: tanks, armored personnel carriers, self-propelled artillery, towed artillery, AAA guns, 2 ½ ton military trucks, command posts, and surface-to-air missiles.

⁸ Phil Haun, *RAF Air Power Review*, 77. The Serbian 3rd Army ground order of battle was not even compiled at the Combined Air Operations Center until the flexible targeting shop was set up within the C-2 intel division in May of 1999.

integrate into FAC packages. As with the Mistys, the A-10 FACs were often forced to locate targets on their own.

As the weather continued to improve in May, A-10 FAC strikes intensified, gaining further momentum as the Kosovo Liberation Army's offensive in Western Kosovo forced Serb forces out of hiding. A-10s continued to control the skies over Kosovo until early June, when Slobodan Milosevic relented. Upon his acceptance of the Rambouillet agreement, NATO ground forces entered Kosovo and took control.

Lessons from Misty and A-10 FAC Operations

When drawing lessons from previous conflicts, one must approach the task with caution. The temptation to prepare to fight the last war is as real today as it was in post-World War I France when they decided to build the Maginot line. The examination of these two case studies can help reduce such a risk. Much value can be gleaned from studying the experiences of the Misty and A-10 FACs by focusing on the common challenges they faced in attacking enemy ground forces. Also notable are the factors and policies which restricted operations in Vietnam, but which were overcome in Kosovo. However, contextual variables such as weather, terrain, and political constraints cannot be ignored when making this comparison. In both North Vietnam and Kosovo, airpower was called upon to directly attack enemy forces without the benefit of friendly ground troops to locate, identify, and fix the enemy's position. Given the propensity of the U.S. to task airpower with such a challenge, the USAF should properly train and equip for these operations.

Misty and A-10 FACs demonstrated skill and cunning in engaging the enemy in a way that tightly controlled fighters and bombers could not. These warriors of the

modern air age were told to go find and destroy the enemy. They were not told how to fight their war, but were given, to varying degree, the flexibility to develop and adjust tactics against a thinking adversary. Allowing these guardians of the skies the freedom to fight as they deemed most effective was the single most important factor in their success.

Attacking the enemy involves three phases: target identification, weapons employment, and damage assessment. Target identification and damage assessment require similar intelligence skills and methods: trained and experienced FAC and strike aircrew with onboard sensors to identify and assess targets and ISR equipment and personnel must be capable of collecting, analyzing and disseminating information that is still useful by the time it reaches the battlefield. Weapons employment depends on the training and experience of aircrew, the combat loads of strike aircraft, the accuracy of the weapons delivery systems, and the precision and lethality of munitions. For the USAF to become more successful in this mission, it must become better able to identify and assess targets and employ weapons both day and night, in all weather, in any terrain, and from any altitude.

A key improvement from Vietnam to Kosovo was that the maturation of precision-guided munitions, as well as the development of accurate medium-altitude weapons delivery systems. This solved the problem of killing mobile enemy armor *once identified*. Laser-guided bombs, Maverick missiles, and even such freefall munitions as CBU and general purpose bombs can be effectively employed day and night at medium altitude. Still, all-weather weapons employment against mobile targets remains a challenge for U.S. airpower. While B-2s dropped GPS-guided bombs against fixed

targets in Serbia, none were directed at Serbian fielded forces. Since Kosovo, U.S. tactical aircraft have been fitted with GPS-guided munitions, which may provide a partial solution for all-weather capabilities.

While work on weapons employment certainly needs to continue, the real weakness of airpower lies not in weapons employment, but in target identification and assessment. The following discussion covers urgently needed improvements in equipment, training, and doctrine that are required for the USAF to more effectively defeat an army.

TARGET IDENTIFICATION AND DAMAGE ASSESSMENT EQUIPMENT ISSUES

The following four recommendations address the most serious shortfalls in target identification: onboard target identification systems for FAC and strike aircraft, all-weather target identification, integration of UAVs with conventional strike forces, and an intelligence infrastructure able to quickly access, filter, and distribute ISR products. Gains made in any of these four areas will increase the overall efficiency of air operations.

- Misty and A-10 FACs demonstrated that fighter pilots equipped with as little as commercially available cameras and binoculars could locate the enemy with their own skill and cunning. However, the *onboard target identification capability of airborne FACs and strikers should be upgraded with advanced optical and infrared targeting systems*. Such systems are needed to permit

both day and night medium altitude operations. *These upgrades should be given higher priority than that given to weapons and weapons delivery upgrades.* It makes little sense for the USAF to upgrade its aircraft to drop better bombs until it can first locate and identify the targets to be struck.

- The ability to identify valid targets in all weather conditions will continue to be one of the greatest challenges to air operations. Though JSTARS cannot effectively differentiate between civilian and military vehicles, its synthetic aperture radar (SAR) and moving target indicator (MTI) does provide an all-weather capability. JSTARS could prove decisive in conflicts where the risk of collateral damage is not great. *Continued SAR/MTI research and system upgrades are warranted in the face of all-weather target identification challenges.*
- One of the heroes of Kosovo was the Predator UAV with its ability to positively identify Serbian troops. Furthermore, the more recent use of Predators armed with hellfire missiles over Afghanistan demonstrates an aggressive effort by the USAF to use UAVs in a more offensive role. *Fully integrating UAVs into strike packages will improve the ability of the USAF to capitalize on the real time identification capability of these surveillance assets. Much work needs to be done in the areas of target marking and radio and Identification Friend or Foe (IFF) equipment upgrades.*

- Misty and A-10 FACs operated with little outside intelligence in locating targets. Additional emphasis is needed on expediting quality ISR products to the tactical warfighter. *Air Force intelligence organizations must continue to develop a robust digital network that allows immediate access to a variety of ISR assets. Intelligence personnel could then more swiftly filter, process, and forward information through joint/coalition channels.* This system must be compatible with all available ISR assets including national assets, joint, and combined ISR systems.

Training and Tactics Issues

The USAF needs to adjust its training and tactics to more effectively prepare its airmen to attack armies. An Air Force that does not train or develop such tactics will not have the requisite skills when confronted with combat. The adage of “fight the way you train” is true from two perspectives. First, it makes sense to take those tactics and techniques honed during peacetime into combat. A second more subtle implication is that military forces have no other option but to fight the way they train. It is training that develops the tactical skills and mindset that defines a combat force’s capabilities. Two recommendations, if heeded, should improve U.S. airpower’s ability to strike ground forces: incorporate the direct attack of fielded forces into major USAF exercises and adjust Air Force Tactics Techniques and Procedures (AFTTP) 3-1 series publications to include this mission.

- *Major exercises such as Red Flag, Air Warrior, and Cope Thunder should incorporate the direct attack of fielded forces as a primary mission. The Conventional Air Forces (CAF) need continuous peacetime exposure to the mission, becoming familiar with the challenges and skills required to meet it. Along with FAC strike packages, these exercises should incorporate Predator and JSTARS ISR platforms into conventional strike packages. Likewise, intelligence systems need to be exercised, not simulated.*
- The Air Force should address current shortfalls in tactics through its Air Force Tactics Techniques and Procedures (AFTTP) 3-1 series publications, introducing a systems approach to attacking fielded forces. Currently, the tactics that have been developed are found in specialized volumes for each platform. *A separate volume on the direct attack of fielded forces should be developed, focusing on the integration of U.S. and coalition ISR, intelligence, command and control, FAC, and strike assets.*

DOCTRINAL ISSUES

Current Air Force doctrine is written with the underlying assumption that air strikes against fielded forces will be in support of land operations. However, the direct attack of the Serbian 3rd Army was neither in preparation for nor in support of ground forces. Joint and Air Force doctrine must adapt to the reality of how U.S. airpower is now being employed. The following two changes to USAF Counterland doctrine should

help clarify this shift in the application of airpower: reclassify Counterland missions under direct and indirect attack and redefine Forward Air Controller.

- USAF and Joint doctrine acknowledges two Counterland missions: Air Interdiction and Close Air Support. Both of these missions are defined by their relationship to friendly forces.⁹ *Counterland should be regrouped into direct and indirect attack. Direct attack is the use of airpower against an enemy's fielded forces. Close Air Support is a subset of direct attack, acknowledging the detailed integration required should friendly forces be in close proximity to the enemy. Indirect attack is the use of airpower against an enemy's military potential before it can be fielded. Air Interdiction is a subset of indirect attack, whereby airpower is used against enemy's assets before they can be brought to bear against friendly forces. Discussing Counterland in terms of direct and indirect attack makes more sense than the current doctrine, which ties these missions to the presence of friendly ground forces.*
- Current Air Force Doctrine defines the airborne Forward Air Controller only within the Close Air Support Mission:

A specifically trained and qualified aviation officer who exercises control from the air of aircraft engaged in close air support of ground troops. The

⁹Joint Publication 3-0, *Doctrine for Joint Operations*, (February 1, 1995), GL 3-4. Air Interdiction is defined as operations conducted to destroy, neutralize, or delay an enemy's military potential before it can be brought to bear against friendly forces. Close Air Support involves actions by aircraft against hostile targets in close proximity to friendly forces requiring detailed integration.

forward air controller (airborne) is normally an airborne extension of the tactical air control party.¹⁰

This definition does not acknowledge the role of the Misty and A-10 FACs in conducting visual reconnaissance and battle damage assessment. *Forward Air Controller should be redefined in AFDD 2-1.3 as:*

¹⁰ AFDD 2-1.3, 93.

A specifically trained and qualified aviation officer who performs visual reconnaissance, exercises strike control, and conducts battle damage assessment for aircraft engaged in the direct and indirect attack of enemy ground forces.¹¹

Concluding Remarks

A comparison of the Misty and A-10 FAC missions clearly demonstrates a failure of the USAF to develop suitable tactics for the direct attack of enemy fielded forces. The USAF will continue to be called upon to attack armies without the presence of friendly ground troops to provide targeting. Although quantum leaps in weapons delivery accuracy from Vietnam to Kosovo now make it possible to destroy armor and artillery from the air, there has not been a corresponding improvement in airborne target identification. Until the USAF prioritizes the direct attack of ground forces and target identification, its ability to effectively attack such forces will remain an illusion. Misty and A-10 FACs were resilient warriors who overcame many obstacles by sheer determination and tactical innovation to root out the enemy and get the job done. Drawing from their lessons, the recommendations presented here focus on equipment, tactics and training, and doctrine. However, airmen should understand that there is no

¹¹ AFDD 2-1.3, 54. A benefit of the expansion of this definition would be the removal of the Killer Scout from Air Force doctrine. The Killer Scout role has two key weaknesses which limit its effectiveness. Killer Scouts do not limit the potential of collateral damage, being untrained in positive air strike control. Killer Scouts also become ineffective once friendlies are involved, since they are untrained in Close Air Support.

silver bullet for the challenge of target identification. No single piece of equipment or advance in technology will solve the problem. Airmen must first develop the proper doctrine and tactics, then take their equipment and train as realistically as possible. Only then can the USAF reach its potential for defeating an enemy army in the field.

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