

DTIC FILE COPY

2

AIRFIELD SEIZURE
The Modern "Key to the Country"

A Monograph
by
Major Gordon C. Bonham
Infantry



DTIC
ELECTE
MAR 22 1991
S B D

School of Advanced Military Studies
United States Army Command and General Staff College
Fort Leavenworth, Kansas

First Term AY 90-91

Approved for Public Release; Distribution is Unlimited

AD-A233 189

91 3 19 113

REPORT DOCUMENTATION PAGE			Form Approved OMB No. 0704-0188	
Public reporting burden for this 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, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503.				
1. AGENCY USE ONLY (Leave blank)		2. REPORT DATE 27/12/90		3. REPORT TYPE AND DATES COVERED MONOGRAPH
4. TITLE AND SUBTITLE AIRFIELD SEIZURE, THE MODERN "KEY TO THE COUNTRY"			5. FUNDING NUMBERS	
6. AUTHOR(S) MAJOR GORDON C. BONHAM				
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) SCHOOL OF ADVANCED MILITARY STUDIES ATTN: ATZL-SWV FORT LEAVENWORTH, KANSAS 66027-6900 COM (913) 684-3437 AUTOVON 552-3437			8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)			10. SPONSORING/MONITORING AGENCY REPORT NUMBER	
11. SUPPLEMENTARY NOTES				
12a. DISTRIBUTION/AVAILABILITY STATEMENT APPROVED FOR PUBLIC RELEASE; DISTRIBUTION UNLIMITED			12b. DISTRIBUTION CODE	
13. ABSTRACT (Maximum 200 words) This monograph examines the key determinants necessary for the successful forced entry seizure of an airfield. The importance of contingency operations is paramount to the United States military as it transitions from "forward defense" to "CONUS based." The ability to project power into an isolated objective area requires the rapid deployment and forced entry of a tailored force package. For many of our current OPLANS, the seizure of an airfield serves as a lodgment area for the introduction of combat power into the objective. The success of the entire contingency operation, in large part, depends upon the successful seizure of the airfield. The monograph analyzes three historical cases of airfield seizures using the Mass de Czege combat power model. Operation Mercury (Crete, 1941), Operation Urgent Fury (Grenada, 1983), and Operation Just Cause (Panama, 1989) are examples of operations that introduce combat power into the objective area. This study concludes that an airfield seizure is fundamentally a deliberate attack to seize a terrain oriented objective. Success is achieved by the synchronization of maneuver, firepower, and protection by capable leadership. However, the unique nature of an airfield seizure requires special application of the four elements of combat power to ensure mission accomplishment.				
14. SUBJECT TERMS Contingency Operations			15. NUMBER OF PAGES 56 pages	
			16. PRICE CODE	
17. SECURITY CLASSIFICATION OF REPORT UNCLASSIFIED	18. SECURITY CLASSIFICATION OF THIS PAGE UNCLASSIFIED	19. SECURITY CLASSIFICATION OF ABSTRACT UNCLASSIFIED	20. LIMITATION OF ABSTRACT UNLIMITED	

SCHOOL OF ADVANCED MILITARY STUDIES

MONOGRAPH APPROVAL

Major Gordon C. Bonham

Title of Monograph: Airfield Seizure
The Modern "Key to the Country"

Approved by:

LTC James M. Dubik
LTC James M. Dubik, MA

Monograph Director

William H. Jones
Colonel William H. Jones, MA, MMAS

Director, School of
Advanced Military
Studies

Philip J. Brookes
Philip J. Brookes, Ph.D.

Director, Graduate
Degree Program

Accepted this 31st day of December 1990

ABSTRACT

AIRFIELD SEIZURE, THE MODERN "KEY TO THE COUNTRY"
by MAJ Gordon C. Bonham, USA, 56 pages.

This monograph examines the key determinants necessary for the successful forced entry seizure of an airfield. The importance of contingency operations is paramount to the United States military as it transitions from "forward defense" to "CONUS based." The ability to project power into an isolated objective area requires the rapid deployment and forced entry of a tailored force package. For many of our current OPLANS, the seizure of an airfield serves as a lodgment area for the introduction of combat power into the objective. The success of the entire contingency operation, in large part, depends upon the successful seizure of the airfield.

The monograph analyzes three historical cases of airfield seizures using the Wass de Czege combat power model. Operation Mercury (Crete, 1941), Operation Urgent Fury (Grenada, 1983), and Operation Just Cause (Panama, 1989) are examples of operations that introduce combat power into the objective area. This analysis identifies the key determinants for the successful forced entry seizure of an airfield.

This study concludes that an airfield seizure is fundamentally a deliberate attack to seize a terrain oriented objective. Success is achieved by the synchronization of maneuver, firepower, and protection by capable leadership. However, the unique nature of an airfield seizure requires special application of the four elements of combat power to ensure mission accomplishment.

TABLE OF CONTENTS

	Page
I. Introduction.....	1
II. Theory.....	4
III. Operation Mercury.....	9
IV. Operation Urgent Fury.....	18
V. Operation Just Cause.....	27
VI. Conclusions.....	37
VII. Implications.....	40
Figures:	
A. The Relative Combat Power Model.....	42
Maps:	
A. Operation Mercury - Maleme Airfield..	43
B. Operation Urgent Fury - Point Salines.	44
C. Operation Just Cause - Torijos Tocumen	45
Endnotes.....	46
Bibliography.....	52

Accession For	
NTIS GRA&I	☒
DTIC TAB	☐
Unannounced	☐
Justification	
By _____	
Distribution/	
Availability Codes	
Dist	Avail and/or Special
A-1	



INTRODUCTION

"In support of U.S. interest we must conduct a forced entry to seize and secure an [airfield] while building enough combat power to fight, sustain itself, and win the initial battle."

With the symbolic crumbling of the Berlin Wall, the United States military finds itself in a period of transition. The post World War II policy of "forward defense" is rapidly changing to a policy of "forward presence." East-West tension and distrust are rapidly dissolving into open exchange and cooperation. The threat of a Soviet attack on NATO has virtually disappeared, but all threat to the United States' global interests has not.

The proliferation of weapons technology, along with state supported terrorism, has created an unstable and dangerous world situation. Without warning, vital American interests may be threatened anywhere in the world. This threat has shifted the United States military's focus from NATO to contingency operations.

The importance of contingency operations has become paramount to the military. As forward deployment of forces decreases and the global threat increases, the ability to project power rapidly to deter or defeat aggression becomes the military's most important mission. The ability to project power into a hostile or nonpermissive objective area requires the rapid strategic deployment of a tailored force package that possess a forced entry capability.

The essence of power projection, within the context of a contingency operation, is captured by the key words rapid, tailored, and forced entry. The rapid strategic deployment is critical to prevent the further deterioration of the situation. This

frequently requires the movement of the force, or at least the vanguard, by air. Contingency operations require a credible and versatile force tailored to the unique situation. The mix of heavy, light, and special operation forces is determined by an analysis of the threat and the objective area. The force package requires a secure staging area to transition from deployment to employment. When this is not available, a forced entry into the objective area is required to seize and secure a forward base for the introduction of combat forces.

The seizure of a secure lodgment area is essential for the projection of ground combat power into a hostile objective area. The deployment of the initial force package by air requires the lodgment area include an operational airfield. Once the airfield is secure, the rapid buildup of combat power and sustainment can begin. In certain situations, the entire contingency operation may depend upon a successful airfield seizure. In this case, the seizure of an operational airfield becomes, as Clausewitz would say, "the key to the country."

The forced entry seizure of an airfield is a difficult and complex operation. Because of time and distance, the forced entry mission is normally, but not exclusively, preformed by airborne or special operation forces (SOF). These units are lightly equipped and extremely vulnerable to enemy maneuver and firepower. The seizure of an airfield is further complicated by the restricted use of fire support, close air support, and even direct fires. Unlike a denial mission, an airfield seizure requires the limitation of fires to prevent the destruction of the airfield and its facilities. These restrictions require the airfield seizure force

to apply the elements of combat power uniquely to destroy the enemy force and preserve the airfield for follow-on forces.

Many of our current OPLANS are designed around the forced entry seizure of an airfield to introduce follow-on forces. The airfield is critical for the success or failure of the entire operation. Without a secure operational airfield, the combat power necessary "to fight, sustain, and win" cannot be employed within the operational window of opportunity. Therefore, to successfully conduct contingency operations we must understand the key determinants for a successful airfield seizure.

The subject of forced entry airfield seizure is currently not addressed in our manuals, which still reflect the concept of forward based forces in a mature theater of operations. FM 100-15, Corps Operations, includes a cursory discussion of airfield seizure within the context of contingency operations.³ The draft manual for airborne operations addresses some of the tactics, techniques, and procedures (TTP) for airfield seizure.⁴ However, these manuals fail to identify the principles, imperatives, and synchronization of the elements of combat power required for a successful airfield seizure.

The purpose of this monograph is to identify the key determinants necessary for the successful forced entry seizure of an airfield. A review of classical theory will provide a foundation for the introduction of my criteria which is the Wass de Czege combat power model. I will then apply this model to analyze three historical examples of forced entry airfield seizure operations: Operation Mercury (Crete 1941), Operation Urgent Fury (Grenada 1983), and Operation Just Cause (Panama 1989).

The nature of a forced entry airfield seizure is one of risk. The initial force ratio will favor the defender of the airfield and not the assault force. To seize the airfield successfully, the assault force must overcome the defender's advantages by some means other than troops or weapon systems on the ground. The classical theory of Clausewitz and Jomini and BG Huba Wass de Czege's model for the development of combat power provide significant insights for the accomplishment of this unique mission.

Theory

If there is an area without the possession of which one can not risk an advance into enemy territory, it may correctly be designated as the key to the country.⁵

The forced entry seizure of an operational airfield in the conduct of a contingency operation is comparable to the Clausewitzian concept of "the key to the country." Clausewitz defines "the key to the country" as the critical area or point which must be secured before an operation can be conducted. A contingency mission requires a secure base of operations from which combat power can be introduced, projected from, and sustained in order to conduct operations. The seizure of an airfield is one means to secure a staging area in a time-sensitive contingency operation.

For a contingency operation that depends upon the seizure of an airfield for the introduction of forces, the airfield is clearly a decisive point. Jomini defines a decisive point "by the character of the position, the bearing of different localities upon the strategic object in view, and by the arrangement of the contending forces."⁶ Because the success or failure of the airfield seizure is "capable of exercising a marked influence upon the result of the campaign" Jomini would classify it as a decisive

strategic point.⁷ The airfield, because of its location, with respect to the enemy and the objective area, provides a position of influence for follow-on operations. This is the pivotal importance of the airfield and its relationship to the overall operation. However, this fact has not escaped our enemy, who will attempt to deny us "the key to the country."

"It is a risky business to attack an able opponent in a good position."⁸ Enjoying the advantages of the "intrinsically stronger. . . defensive form of warfare," a relatively small enemy force can easily deny the seizure of an airfield.⁹ The airfield facilitates the transition of combat potential to combat power by providing a lodgment for the introduction of forces to the objective area. By denying the seizure of the airfield, the enemy force can prevent the introduction of forces and the transition of combat potential to combat power.

Clausewitz submits that the defense enjoys the advantage of terrain and time.¹⁰ In respect to the seizure of an airfield, these two advantages can be overwhelming. A well positioned, fully integrated defense can dominate an airfield which provides the defender open fields of fire and denies the attacker cover and concealment. This, combined with the initial vulnerability of a vertical envelopment, provides the defender a significant edge. Time permits the reinforcement of the defense to complete the destruction of the force entry package and insure the denial of the airfield. To successfully seize the airfield, the attacker must overcome these defensive advantages, like any deliberate attack.

"Airfield seizure is a conventional assault [deliberate attack] against a fixed target. We assault an airfield vice Hill 236."¹¹ To successfully seize an airfield, the attacker must

minimize the advantages of the defense while exploiting the advantages of the offense, initiative and surprise.¹²

"The one advantage the attacker possesses is that he is free to strike at any part along the whole line of defense and in full force."¹³ This permits the attacker to prepare a detailed plan, tailored for the selected objective, while the defender can only speculate as to the location of the assault. For a contingency operation, the attacker can focus on one or two airfields while the defender must cover all potential objectives and rely on the advantage of time to counterattack once the assault is initiated. This is why "the aim of the commander in the offensive battle is to expedite the decision" in order to interdict the defender's advantage of time.¹⁴

Speed becomes a critical factor once the inherent advantage of initiative is lost with the commitment of forces. Speed is also a critical element in the second offensive advantage. To overwhelm the defender's advantage "surprise is the means to gain superiority. . . at the decisive point."¹⁵

"The two factors that produce surprise are secrecy and speed."¹⁶ The ability of the United States to conduct a contingency mission with complete secrecy is virtually impossible given our open society and the state of surveillance technology. Yet despite the loss of strategic surprise, tactical surprise can still be "easily carried out in operations requiring little time."¹⁷

By exploiting the speed of the initial strike the loss of strategic surprise can be offset. Despite the defender's knowledge that an operation may be underway, he still may not know the

exact location of the assault. "Surprise does not consist simply in falling upon troops that are sleeping [but] from a combination of a sudden attack upon and a surrounding of one extremity."¹⁸ By rapidly seizing an airfield and isolating it from counterattacks, combat power can be introduced into the theater of operations before the defender can react--the essence of tactical surprise.

Clausewitz cautions that although surprise appears "highly attractive in theory" as a means to overcome the defender's advantage, "in practice it is often held up by the friction of the whole machine." Historical analysis led Clausewitz to conclude that "it would be a mistake to regard surprise as a key element in war."¹⁹ "Superiority of numbers is the most important factor in the outcome of an engagement."²⁰

Clausewitz' conclusion that combat power is primarily a function of the size of the force was applicable to the Napoleonic armies of his day. However, size does not explain how a small, light, assault force can overwhelm a determined defense and successfully seize and secure an airfield by forced entry. The explanation is provided by BG Huba Wass de Czege's theory for generating combat power.

Wass de Czege challenged the concept that combat power, which FM 100-5 defines as "the ability to fight," is derived solely from force ratios and "number crunching."²¹ Although the number of troops and artillery pieces are important, Wass de Czege argues that combat power is also a function of "intangible attributes." Surprise, shock effect, and the leaders ability to bring "potential strength and resources. . . to bear against the enemy" are the real keys to the generation of combat power.²²

Wass de Czege identifies four components of combat power. Maneuver is the dynamic element and is defined as "the movement of forces in relation to the enemy to secure a positional advantage." "Firepower provides the destructive force essential to defeating the enemy's ability and will to fight." "Firepower facilitates maneuver" and provides protection for the force by destroying or suppressing the enemies combat power. "Protection is the shielding of the fighting potential of the force so that it can be applied at the decisive time and place." Leadership is "the most essential element of combat power." The leader is responsible for synchronizing the other three elements to maximize their effects against the enemy. The leaders application of maneuver, firepower, and protection against the enemy at the decisive point converts combat potential to combat power.²³

To avoid the empirical relationship of force ratios, Wass de Czege's concept of combat power is not absolute, but relative to the enemy's combat power. The leader's ability to develop combat power is effected by the enemy's actions against him. Likewise, the "fog and friction of war" will have a negative affect upon both forces. Wass de Czege summarizes the relationship of these forces on combat power as follows: (see Figure A for analytical model).

The outcome of the battle depends upon the difference in combat power of the antagonist. Combat Power is the result of what leaders do with the maneuver, firepower, and protection capabilities of their units. Combat power is affected by the efforts [of] the antagonist to degrade the combat capabilities of the other while minimizing the effects of such actions on their own capability.²⁴

Wass de Czege's combat power model provides a framework to analyze the forced entry seizure of an airfield. Unable to rely

of superior numbers, the assault force must develop overwhelming combat power through the synchronization of maneuver, firepower, and protection. Incorporating the intangible elements of speed, surprise, and shock effect, the leader must generate sufficient combat power, relative to the enemy, to seize and secure the airfield. Once accomplished, the assault force must quickly transition to the "intrinsically stronger" defense to gain the advantage of time to allow follow-on forces to rapidly reinforce the airhead.

Therefore, the success of an airfield seizure operation is determined by the relative combat power of the assault force to the defender. Operations Mercury, Urgent Fury, and Just Cause, all examples of forced entry airfield seizure, illustrate the applicability of the Wass de Czege combat power model.

OPERATION MERCURY

Operation Mercury was conducted by the German Luftwaffe, 20 May to 2 June 1941, to seize the Island of Crete. The intent was to secure the Mediterranean air and sea lines of communication and protect the Polesti oil fields from Allied air strikes. In theory, "whoever held [Crete] could maintain strategic control over Southern Europe, North Africa, and the Near East."²⁵ Many military leaders believed Malta was the key to the Mediterranean, and advised against the "Luftwaffe's" stunt for glory. On the eve of Operation Barbarossa, a reluctant Adolf Hitler approved the diversion with Goering's promise for a quick, and painless victory.

The plan for Operation Mercury was a compromise between two different concepts. LTG Kurt Student, commander of the XI Air Corps, proposed simultaneous glider and airborne assaults to seize the island's three airfields and four major communication centers.

General Alexander Lohr, commander of the 4th Air Fleet and Student's superior, thought that Student's plan was too ambitious. He proposed a "schwerpunkt" to seize the airfield at Maleme with two parachute and one glider regiments while maintaining one parachute regiment in reserve. Once secured, reinforcements would airland to "roll-up the allies flank."²⁶

The plan that evolved was a three phased operation. The first phase was an airborne assault to secure Maleme Airfield and the capital city of Khania. The transports would return to Greece, refuel, and load the remaining paratroopers for the second phase. Phase two would commence at H+8 to seize and secure the airfields at Rethimnon and Iraklion. The final phase would reinforce the airborne forces with the 5th Mountain Division to complete the invasion.²⁷

The phasing of the operation provided Lohr an initial emphasis on Maleme. Student was satisfied that all key objectives would be seized on the first day in a splendid display of Luftwaffe capability. But the piecemeal phasing of the invasion failed to concentrate forces in a main effort. Additionally, Student's ambitious plan did not provide a reserve with forced entry capability. These two shortcomings were recognized by Student as reasonable risks based on what his intelligence called "token resistance."

The G-2 of the 7th Airborne Division reported that Crete was defended by a poorly equipped garrison of approximately 6,000 soldiers without an antiaircraft defense of the airfields.²⁸ This intelligence estimate was grossly inaccurate. MG Freyberg, Crete Defense Force Commander, was in charge of a composite force of 46,000 Allied soldiers. Freyberg placed special emphasis on airfield defense and told his subordinate commander's, "you must deny

the airfields to the enemy at all cost." OPSEC, camouflage, and a no fire order for all ADA weapons, denied the Germans the true defensive posture around the airfields.²⁹

The seizure of Maleme Airfield was assigned to MG Meindl, Commander of Task Force Comet. After a one-hour preparatory bombing by the 8th Air Corps, the Assault Regiment was to conduct a simultaneous airborne and glider assault to seize Maleme Airfield and Kavzakia Hill (Hill 107) that overlooks the airfield. Two parachute battalions would drop west and east of the airfield to isolate the objective while glider forces, landing directly on the airfield, would overpower the defenders of Hill 107 and clear the runway. With close air support offsetting the Assault Regiment's lack of firepower, the airfield was anticipated to be secure by 1200 hours.³⁰

The plan started to fall apart when the gliders and paratroopers were met with unexpected and intense ADA fire. Except for the western drop zone, assault forces missed their drop zones by as much as four miles. The 1st Assault Battalion successfully established the western blocking position, but 3rd Assault Battalion was destroyed after landing on a New Zealand engineer battalion. Gliders crashed into terraced hillsides that aerial photo analysis identified as flat landing zones. The combination of air defense fire, missed drop zones, and the defensive fire from the 22d New Zealand Battalion's (22d NZ Bn) positions on Hill 107, defeated the assault to secure the airfield.³¹

Meindl, suffering from injuries, pieced together an attack in the late afternoon to capture Hill 107. With the 4th and 2d Assault Battalions, Meindl attempted to secure the airfield in order to receive airland forces and resupply during the hours of

darkness.³² The attack failed to secure Hill 107 which dominated the airfield. Unable to continue, desperate for ammunition, and suffering from 36% losses, Meindl prepared for the 22d NZ Bn counterattack that could destroy Task Force Comet.³³

LTC Andrew, Commander 22d NZ Bn, did not realize the desperate enemy situation relative to his own. After an urgent request for ammunition and reinforcements was denied, Andrew felt that his only course of action was to withdraw during the night. Despite Freyberg's intent and the significance of Hill 107, BG Hargest authorized Andrew's withdrawal instead of committing his reserve.³⁴

At first light on 21 May, German patrols moved up Hill 107 to probe the 22d NZ Bn positions. They were shocked to find the hill deserted. A defensive perimeter was quickly established and the runway was cleared of debris. By the end of 21 May, one battalion of the 5th Mountain Division arrived to reinforce the beleaguered Assault Regiment.³⁵ Maleme Airfield provided "the key to the country" and unlocked the door to victory for the Germans.

But the assault failed to generate overwhelming combat power relative to the defensive positions on Hill 107. The combination of maneuver, firepower, and protection, by the German leadership failed to seize the airfield from the 22d NZ Bn. Only the indecision of Allied leaders and the "fog and friction of war" prevented a German disaster in Crete.

Maneuver

Maneuver "is the dynamic element of combat--the means of concentrating forces at the [decisive] point to achieve the surprise, shock, speed, and moral dominance which enable smaller forces to defeat larger ones."³⁶ An airborne force is able to conduct rapid strategic maneuver, but lacks tactical mobility. To achieve the

surprise, speed, and shock effect of maneuver, the forced entry must be directly on the decisive point. If the force is inserted anywhere else, the assault loses the effect and multiplies the defender's advantage of time and terrain.³⁷

The assault on Maleme failed to concentrate forces at the decisive point. With the exception of the gliders, the assault force was inserted away from the airfield. This required the paratroopers to conduct a movement to contact prior to assaulting the airfield. Because of the inaccurate drops and casualties, Meindl could not assemble an assault force against Hill 107 for seven hours. This failed to achieve the desired maneuver effects of speed and shock and maximized the theoretical advantages of the defender.

"Any omission of attack--accrues to the defender's benefit."³⁸ The Allied defenders capitalized on the Germans failure to maximize maneuver. The piecemeal assault allowed the defenders time to defeat the assault force in detail. The 22d NZ Bn maintained positional advantage by controlling Hill 107 and the airfield. This enhanced their firepower and protection while degrading the combat power of the assault force.

However, "maneuver will rarely be possible without firepower and protection."³⁹ Even if Meindl assaulted directly onto the airfield, the outcome of the battle may have remained the same. The failure of the German maneuver effect is directly related to the failed firepower effect.

Firepower

The assault forces lacked the organic firepower necessary to suppress and destroy the enemy defenses. The Regiment had no artillery and their light mortars and machine guns were ineffective

against prepared positions. This disparity was anticipated by the planners and compensated with air power.⁴⁰

The 8th Air Corps would provide the necessary firepower for the assault. The preparatory bombing, the heaviest since the Battle of Britain, was to destroy the defenses around the key objectives. The high altitude bombers were followed by JU-88 Stuka Dive Bombers to complete the destruction of point targets. ME-109's provided close air support for the paratroopers to offset their initial vulnerability and assist in isolating the objective.⁴¹

The Luftwaffe's firepower failed to provide the combat multiplier required to overcome the Allied defenses. Air superiority and the elimination of ADA weapons is required for an airfield seizure. The preparatory bombing failed to destroy the air defenses and well prepared positions around Maleme. This resulted in catastrophic losses of gliders and transports and degraded the close air support of the JU-88s and ME-109s. But the greatest weapon that prevented the close air support of the assault was the friction of war.

The synchronization of air and ground forces was linked to the time line for the operation. When the time line broke down, the 8th Air Corps was unable to adjust. Delays created time-space disconnects between preparatory air strikes and ground assaults. Paratroopers delivered to the wrong drop zones were unsupported. Because of refueling delays, Meindl's assault to seize Hill 107 was conducted without close air support.⁴²

The inability to suppress and destroy the Allied defensive positions increased the exposure of the German paratroopers. Operation Mercury resulted in more casualties than the entire

"Wehrmacht" suffered in the previous two years of fighting. At Maleme, the Assault Regiment was rendered combat ineffective suffering over 50% casualties.⁴³ This resulted from a failure to protect the combat effectiveness of the force.

Protection

An airborne assault relies on surprise and the cover of darkness to protect the force. Student sacrificed both of these factors during Operation Mercury. Although strategic surprise was lost to ULTRA on 16 April, the assault forces retained tactical surprise (time, means, and exact location). However, tactical surprise and the protection of a night assault were forfeited to exploit the Luftwaffe's daylight superiority.⁴⁴

The plan assumed that air power would protect the exposed assault forces on the ground. Tactical surprise was traded for the preparatory bombing designed to reduce the enemy defenses. The risk of a daylight airborne assault was offset by the advantage of close air support and the suppression of enemy defenses by the "Luftwaffe."

A forced entry operation requires a careful risk assessment. The threat to the force must be identified in order to provide protection. Intelligence is critical in the risk assessment of the operation. The inaccurate estimate of Maleme's defenses led the German leaders to incorrect assumptions which proved disastrous.

The "Luftwaffe" did not protect the Assault Regiment. The preparatory bombing failed to destroy the defenses and sacrificed tactical surprise. Troop transports and paratroopers were unprotected from the deadly air defense fire. The close air support failed to reduce Hill 107. This forced Meindl to assault uphill,

over open ground, against prepared positions. The Luftwaffe's failure to suppress and destroy the enemy defenses resulted in the destruction of the Assault Regiment.

In addition to protection of the force, an airfield seizure demands the protection of the airfield itself. Once seized, it is critical to rapidly expand the airhead perimeter to protect the runway, and other facilities, from destruction and interdiction. Ideally the airhead should protect the airfield from direct fire, mortar, and observed indirect fire.

The Assault Regiment was unable to protect the airfield. When Meindl assumed control of Maleme, he could not expand the airhead because of casualties and ammunition shortages. The airland operations were conducted under sporadic mortar attacks until 23 May when the 5th Mountain Division expanded the airhead.⁴³

The failure to adequately protect the force resulted in the significant reduction of the Assault Regiment's combat power. But despite catastrophic losses, the Regiment did not disintegrate and continued to fight. This can only be attributed to the fourth element of combat power, leadership.

Leadership

In his analysis of Crete, Maurice Tugwell stated "the failure [of the operation] originated in the plan."⁴⁴ The leadership requirement is to develop a simple, flexible plan that can be violently executed. The German leaders developed a complicated plan based on an intricate time schedule. The plan lacked flexibility and could not survive the "friction of war." The over commitment of forces failed to provide a main effort or a parachute reserve. The lack of a reserve with forced entry capability

denied Student the ability to effect the battle once it was set in motion.

The execution of Student's plan was further diminished by the loss of senior leadership during the assault. The 7th Airborne Division Commander and his entire staff were lost enroute to Crete. The Assault Regiment lost three battalion commanders, one of the glider detachment leaders, and Meindl and another battalion commander were seriously wounded.⁴⁷ Fortunately, subordinate leaders took command and continued the mission based on a clear understanding of the commander's intent.

Communication problems also degraded leadership effect. Meindl could not communicate with his subordinates or his superiors because of a complete loss of communications during the assault. This reduced his ability to influence the battle and contributed to the lack of coordination and delay in the attack of Hill 107. Unable to obtain the current situation from Meindl, Student initiated phase two with his remaining airborne forces. When Meindl finally contacted Student at 1615 hours it was too late to redirect the forces to Maleme.⁴⁸ Had it not been for Allied errors, the combination of German leadership failures may have proven fatal.

The Allied leader's decision to withdraw from Hill 107 forfeited their victory. Andrew did not realize his greater combat power relative to the attacker, and withdrew from Hill 107. Hargest's indecisive leadership withheld two battalions from counterattacking the Germans at Maleme. Student's final assessment of the battle was, "if the [New Zealanders] had counterattacked during the night of the 20th or the morning of the 21st then the Regiment could have been wiped out."⁴⁹

Conclusion

The assault to seize Maleme Airfield failed to generate the combat power necessary to secure the "key to the country." The dispersion of forces did not facilitate concentration against the airfield. The plan's inflexibility prevented the effective synchronization of maneuver, firepower, and protection by the German leadership during execution.

In retrospect, Lohr's "schwerpunkt" to seize Maleme was the better plan. In fact, Lohr's concept for seizing the "key to the country" would provide the template for future planners to seize an airfield on the Caribbean Island of Grenada.

OPERATION URGENT FURY

Grenada became a focus of attention for the United States in the late seventies. In 1979, the Marxist government of Maurice Bishop signed an agreement with Cuba for the construction of a 10,000 foot runway at the southern tip of the Island. Publicly promoted as an initiative to increase tourism, the airport complex was clearly a military airfield. Grenada's strategic location on the Caribbean shipping lanes and the power projection the airfield would provide Cuba concerned the United States. Bishop's anti-American rhetoric and his relations with the Soviet Union and other Communist Block countries aggravated fears of another Cuban surrogate on our southern flank. These fears were brought to a crisis point on October 19, 1983.⁵⁰

In response to perceived moderation in the government, Bernard Coard, Deputy Prime Minister and a political fanatic, seized power in a bloody coup. In the middle of the anarchy which ensued, were approximately 1,000 American students who attended the Grenada

Medical School. Fearing another Iran Hostage Crisis, President Reagan authorized a military operation that would be known as Urgent Fury.

On October 23, 1983, President Reagan signed the National Security Decision Directive authorizing Operation Urgent Fury. The Presidential objectives for the operation were:

1. Protect and evacuate United States Citizens and foreign nationals.
2. Neutralize Cuban and Grenadian armed forces.
3. Stabilize the country in order to establish a democratic government.
4. Maintain peace.⁵¹

Admiral Wesley MacDonald, CINCLANT, activated JTF 120, under the command of Vice Admiral Joseph Metcalf, to conduct the operation. Forces were selected based on OPSEC, mobility, and reaction time. Almost immediately after receiving the President's directive, JTF 120 issued its operation order designating 250200 Oct 83 as H-Hour.⁵²

The plan used the Greenville - St Georges Road as a boundary to divide the island in half. TF 124, composed of Amphibious Squadron 4, was responsible for the northern half of the island. 22d MAU, diverted from their deployment to Lebanon, would conduct an air assault to secure Pearls Airfield as an alternate site for the introduction of follow-on forces. However, the real "key to the country," and the focus of this section, was the military airfield at Point Salines.⁵³

TF 123, a combination of SOF and two Ranger battalions, would secure the southern part of the island. Because of the C-141/C-5A runway, as well as enemy forces, population and government centers, and the location of the students: JTF 120 designated TF 123 as the main effort. Prior to H-Hour, SOF units would be inserted

to seize critical targets and assist the entry of assault forces. Elements of the 1st Ranger Bn(-) would conduct a combination airborne and airland seizure of Point Salines Airfield and rescue American students located east of the runway. The 2d Ranger Bn(-) would airland and conduct an air assault operation against the military barracks at Calvigny Point. At 1200 hours the Rangers would turn over the airfield to TF 121, a brigade from the 82d Airborne Division, and redeploy.⁵⁴

TF 123 commanders selected an airland insertion for the main body based on intelligence reports of a minimal threat. Like Crete, Grenada would be jinxed by poor intelligence. In reality, the People's Revolutionary Army (PRA) and the People's Revolutionary Militia (PRM) were approximately 5000 not including the 701 combat engineers and advisors from the Cuban Revolutionary Armed Forces (FAR). Point Salines was defended by a 1,000-man force of PRA and FAR, an ADA Battery, and elements of the PRA Motorized Company (BTR-60PB). Commanded by COL Tortolo (FAR), the defense of Salines was oriented to defeat an amphibious assault, but the air threat was not ignored. Barrels, vehicles, and picket fences were positioned to deny runway use. The employment of search lights and ZSU-23 antiaircraft guns on the high ground north of the airfield provided observation and fires over air and sea avenues of approach.⁵⁵

Operation Urgent Fury began with several setbacks for the Rangers. First, H-hour was adjusted to 0500 hours because of a failure to insert one of the SOF teams. Tactical surprise was lost when the SOF team that was inserted to clear the runway of obstacles was detected. At 0330 hours, an AC-130 reported that runway obstacles would prevent the airland operation. Finally,

instrument failure on the lead MC-130 required a formation change which delayed H-hour by an additional 30 minutes. This forced the Rangers to conduct a daylight airborne assault against an alert enemy.⁵⁶

LTC Wesley B. Taylor, Jr., Commander of 1st Ranger Battalion, ordered the Rangers to reconfigure for an airborne assault. Because of the narrow drop zone, high winds (20 knots), and enemy fire; Taylor directed a drop altitude of 500 ft to reduce drift and minimize exposure. The formation change placed LTC Taylor's command group, instead of the jump clearing team, as the initial element in the assault. This became significant as the aircraft made their final approach.⁵⁷

The lead MC-130 was illuminated by spot lights and received heavy antiaircraft fire. At 0537, Taylor's aircraft exited, but the rest of the formation broke off because of the intense air defense fire. Flight lead suspended drop operations and requested AC-130 suppression of the ADA guns north of the runway. From its orbit above the airfield, the AC-130 destroyed the ZSU-23's and protected the Rangers on the ground. The drop was resumed at 0552 hours and continued for an hour as aircraft made individual approaches because of the breakdown of the flight formation.⁵⁸

As assault forces arrived, Rangers began clearing the runway despite intense small arms fire. By 0700 hours the runway was clear and the Rangers began to assault the hillside north of the runway. At 0740 hours, C-130's began airlanding vehicles and weapon systems for the assault force.⁵⁹

With their combat elements assembled, the Rangers began an envelopment of the enemy forces to expand the airhead and protect the runway from direct and indirect fire. B/1-75 attacked in the

west destroying a mortar battery and capturing 175 prisoners of war (PW). A/1-75 rescued 138 American students from True Blue Campus and attacked north to secure Calliste School. 2-75 completed clearing the western end of the runway and secured the hangar complex. Because of the unexpected resistance, 2-75's air assault was postponed in order to reinforce the airhead.⁶⁰

At 1405 hours initial elements of TF 121 began to airland during sporadic PRA mortar fire. As C-141's continued to land, three BTR-60PB's from the PRA's Motorized Company counterattacked into the eastern end of the airhead. The objective was to destroy an aircraft on the runway to predict the reinforcement of the Rangers. The BTR's approached within firing range of the runway, but were destroyed by antitank and AC-130 fire.⁶¹

The failed counterattack was the last significant threat to the airfield. At 1900 hours, TF 121 assumed control of the airhead and attached the Ranger force. Realizing "the key to country" was lost, COL Tortolo radioed Havana requesting permission to surrender. Fidel Castro dramatically replied, "for the glory of the revolution, NO!"⁶²

The seizure of Point Salines was a significant improvement over the attempted seizure of Maleme Airfield in 1941. But despite its success, Urgent Fury failed to convert all the available combat potential into combat power.

Maneuver

Point Salines Airfield was the strategic decisive point for the operation. It provided an entrance for follow-on forces and an exit for the American students. Its seizure would isolate and naturalize the Cuban threat.⁶³ To maximize speed, surprise, and

shock the plan directed the Rangers to jump directly on top of the airfield.

Direct assault onto the decisive point maximizes maneuver effect. The speed and surprise of strategic maneuver denies the defender's advantage of time and terrain, and compensates for the assault force's lack of mobility. Control of the decisive point is immediately challenged. The Rangers were to overpower the defenders and establish a defense while follow-on forces rapidly reinforced the success. But enemy firepower degraded the plan's maneuver effect.

Intense ADA fire interdicted the assault preventing the achievement of speed and mass. The piecemeal insertion of the force caused confusion and delay in seizing and securing the airfield. Once organized, the Rangers secured the high ground which dominated the airfield. However, if the PRA had counterattacked during the early stages of the assault, they may have overwhelmed the Ranger force.

Another problem encountered was the airfield's ramp and runway capacity. Although the runway was capable of handling any size aircraft, the unfinished ramp would accommodate only one aircraft (later expanded to three). This seriously reduced the ability to rapidly build combat power even after the airfield was secured.⁶⁴

The plan maximized speed, surprise, and shock effect, but execution of the plan failed to achieve the intent. Enemy firepower and the airfield's limitations reduced the maneuver effect and disrupted the tempo of the operation. However, these failures were offset by overwhelming firepower.

Firepower

The vulnerability of an airborne assault requires firepower to protect the force and serve as a combat multiplier for maneuver. Overwhelming firepower is essential for the success of an airfield seizure. Air superiority, to include the elimination of ADA weapons, is a prerequisite for success. However, protection of the runway and airfield facilities imposes strict rules of engagement to limit collateral damage. This problem of lethality, accuracy, and control is solved with the AC-130 Gunship.

The AC-130 was the key combat multiplier during Operation Urgent Fury. Suppressing air defense weapons and providing close support for ground forces, as well as real time intelligence; the AC-130 provided continuous coverage for the operation. Its computer targeting provided pinpoint accuracy which one Ranger commander described "like having a sniper in the sky."⁶⁵ MG Edward Trobaugh, Commander of TF 121 and the 82d Airborne Division, replied to a question concerning support requirements by saying, "I'll give up everything before I'll let go of the AC-130."⁶⁶

The Rangers used other weapon systems to enhance their firepower effect. During B/1-75's assault, snipers were employed in order to reduce collateral damage and noncombatant injuries.⁶⁷ A/1-75 used a captured ZSU-23 to suppress a PRA defensive position while Rangers maneuvered to close with the enemy.⁶⁸ Because of the rules of engagement and concern for noncombatants, only one air strike was employed by the Rangers.⁶⁹

Despite a significant firepower potential, the PRA failed to convert it into effective combat power. The positioning of the ZSU-23 guns was designed to engage aircraft flying above 600 ft. and interdict an amphibious landing. When the Rangers came in at

500 ft., most of the ADA weapons could not effectively engage them. This, along with the suppressive fire of the AC-130 effectively negated the FRA's firepower effect and protected the force.⁷⁰

Protection

The decision to fly under the antiaircraft fire provided protection for both aircraft and jumpers. Even under noncombat conditions, a 20 knot wind and narrow strip of land surrounded on three sides by water, is a difficult airborne drop. The reduced altitude not only limited exposure to enemy fire, but prevented the jumpers from drifting into the sea. In Bill Lind's words, "600 Rangers, in daylight, onto a bare runway, within meters of the enemy, and the only casualty is a broken leg is a military miracle."⁷¹

During planning, the Ranger commanders insisted upon a night airborne assault. The original H-hour of 0200 hours was selected to capitalize on the protection provided by a night operation. However, a combination of mishaps and the compromise of the SOF team forced the Rangers to conduct a daylight assault against an alert enemy force.

Firepower plays a key role in the protection of the force. However, the rules of engagement for an airfield seizure restrict the use of firepower to prevent damage to the airfield itself. This limitation of fires exposes the force to greater risk. To offset this, detailed intelligence is required.

The overriding issue is intelligence. If firepower will be inappropriate, great detailed intelligence is essential for success. Seizing an airfield is analogous to attacking a disorganized maze.⁷²

For Grenada, like Crete, the detailed intelligence was not available. Enemy situation, runway and ramp condition, location of the students, and even maps were inaccurate or unavailable. This not only exposed Rangers and students to danger, but provided the leadership a flawed enemy situation for planning.

Leadership

The leader's developed a plan based on inaccurate intelligence. The decision to airland the main body, instead of an airborne insertion, was based on the benign threat that was reported. However, the leaders developed an option to insert the main body by airborne assault if the enemy situation changed. When tactical surprise was lost and a strong enemy defense discovered, the leaders decisively executed the airborne option. The flexibility of the plan allowed determined leaders to overcome the "fog of war."

Communications provided leaders the ability to control the battle. The Air Force Liaison Officer and Combat Control Teams were instrumental in controlling the AC-130 and airland operations. The initial confusion resulting from the piecemeal insertion was corrected with timely FRAGOs to organize the force. However, the clearing of the runway and the seizure of initial objectives were accomplished without direction by aggressive small unit leaders.

Command direction was a problem for the assault force which lacked unity of command. Two coequal commanders and a myriad of joint communication problems between TF 123 and JTF 120 created "friction" during execution. The assault force was formed from

elements of two Ranger Battalions that did not habitually work together. The lack of cohesion, along with the unity of command problem, had a negative impact on the overall leadership effect.⁷³

However, the enemy leadership was unable to exploit these weaknesses and failed to seize the initiative early in the battle. An immediate counterattack during the insertion of the assault force may have overwhelmed the Rangers and denied the airfield. Instead, the enemy allowed the Rangers time to assemble and generate overwhelming combat power relative to the defense. Like Crete, the defender's leadership failure contributed to the combat power and success of the assault force.

Conclusion

Without Point Salines Airfield, the ability to accomplish the President's objectives and convert combat potential to combat power would have been questionable. The airfield provided the "key" for the operation. The plan addressed the theoretical and tactical problems of seizing an airfield by forced entry, but fell victim to the "fog and friction of war" during execution. However, the lessons learned in Grenada contributed to the success of Operation Just Cause.

OPERATION JUST CAUSE

In February 1988, General Manuel Noriega took control of the Panamanian government. Drug trafficking, harassment of American citizens, and attempts to interdict U.S. rights of passage in the Canal Zone resulted in economic sanctions and increased tension. In May 1989, Noriega suspended free elections when the opposition party defeated Noriega's chosen candidate. When violence erupted, President Reagan reinforced American forces in the Canal Zone and evacuated dependents. Tensions continued to build after a coup by

a group of Panamanian Defense Force (PDF) Officers on 3 October 1989 failed. On 15 December, after his appointment as head of state, Noriega declared that a state of war existed between the United States and Panama.⁷⁴

Planning for a military response to the crisis began in March 1988. Originally named "Elaborate Maze," and later changed to "Blue Spoon," the OPLAN outlined a limited operation for removal of Noriega from power. The intent was to minimize contact with the PDF, snatch Noriega from power, and return the country to normalcy. However, this concept was discarded after the October Coup.⁷⁵

The Coup demonstrated the extent of Noriega's power. No longer reliant upon an elite clique, Noriega commanded the loyalty of the 15,000 man PDF as well as the eighteen Dignity Battalions (DIGBATS) that he had formed since 1988. A surgical operation to eliminate Noriega would expose American citizens and the canal to PDF retaliation. Only a massive operation to eliminate Noriega and disable the PDF, before it could react, would protect property and lives from war.⁷⁶

General Maxwell Thurman, CINC SOUTHCOM, directed a rewrite of the OPLAN from a surgical strike to a "Coup de Main." 24,000 troops, 3300 of which would be airdropped in the largest airborne operation since World War II, would simultaneously strike twenty-seven separate objectives to neutralize the PDF and decapitate the Noriega government. The goal was to avoid war through the controlled application of overwhelming combat power to "take the stick out of Noriega's hand."⁷⁷

On 17 December, after the death of a Marine officer and the detention and torture of a Navy officer and his wife, President Bush authorized the Joint Chiefs of Staff to execute OPLAN 90-2. Renamed 'Just Cause' by Secretary of Defense Cheney, the executive order designated 200100 Dec 89 as H-Hour for the operation.⁷⁸

Operation Just Cause included four separate airfields as H-Hour targets. TF Bayonet, 193d Infantry Bde, was responsible for the PDF rotary wing airfield at Albrook. Elements of SEAL Team 4 were to prevent Noriega's escape from Paitilla Airfield where his private Lear jet was located. TF Red, 75th Ranger Regiment, was responsible for two airfields. Elements of the 2d and 3d Ranger Battalions would conduct an airborne assault against the 6th and 7th Infantry Companies located at Rio Hato Airfield. The 1st Ranger Bn(+) would conduct an airborne assault to seize and secure the Torrijos/Tocumen International Airport(T/T).⁷⁹ Although all four missions involved airfields, only the seizure of T/T had the primary focus of seizure versus denial.

The seizure of T/T was critical to provide a secure staging base for follow-on forces. Howard AFB was unable to handle the operation's massive airflow and was vulnerable to PDF interdiction. T/T, composed of the Torrijos International Airport and the collocated Tocumen military airfield, provided fully capable runway and ramp space to accept follow-on forces and serve as an alternate airfield to Howard AFB. T/T would also provide a refuelling and staging area for air assault operations.⁸⁰ However, there were other considerations for the seizure of T/T.

T/T was a decisive point for strategic as well as operational and tactical reasons. T/T is Panama's only international airport and critical to the country's economy. Seizure of the facility

would protect it from damage and retribution. Tocumen was the headquarters for the Panamanian Air Force (FAP) and the 2d Infantry Company (Pumas). To complete the Coup de Main it was essential to eliminate these units. Control of the airfield would deny its use to the PDF and prevent Noriega's escape. Finally, T/T sits astride the east/west avenue between Panama City and Fort Cimarron, home of Battalion 2000. Control of T/T would prevent Bn 2000's reinforcement of Panama City.⁸¹

The plan for the seizure of T/T was designed to rapidly deliver maximum combat power to overwhelm the enemy force and establish a defense while follow-on forces exploited the success. 1st Ranger Bn(+)(C/3-75 attached) would conduct simultaneous airborne assaults on both airfields. A/1-75 and C/1-75 would assault Tocumen to secure the FAP Headquarters and 2d Inf. Co. respectively. B/1-75 and C/3-75 would drop on Torrijos along with vehicle assets to provide additional mobility and firepower. C/3-75's mission was to secure the International Airport Terminal while B/1-75 would derig the vehicles and move to establish blocking positions to seal off the objective. At H+45, TF Pacific (1st Bde, 82d Abn Div) would conduct an airborne assault onto Torrijos to reinforce the airhead and prepare for air assault operations against subsequent objectives.⁸²

On 15 Dec, the Ranger Regiment had just completed a joint training exercise which used the actual T/T OPLAN as the scenario, to include scale model facsimiles of the airport complex. When the 1st Ranger Bn received the warning order on 201700 Dec, the plan was well rehearsed.⁸³

The 1st Ranger Bn loaded twelve C-141's and four C-130's in a bitter cold storm on 19 Dec.⁸⁴ At 2200 hrs, PDF command radio

nets began reporting of the impending invasion and ordered that runways be blocked to deny their use. Fearing compromise, General Thurman ordered the assault against the "Commandancia" (Noreiga's headquarters) to commence fifteen minutes earlier than the scheduled H-Hour. As the Rangers approached their drop zone they were told that the operation was compromised and that the enemy was "waiting on the runway with rifles and grenades."⁸⁵

At 0100 hours, preparatory fires were directed against T/T by AC-130 gunship and special operation helicopters. The AC-130 engaged the 2d Inf. Co. barracks and the helicopters directed rocket fire against the FAP control building and a PDF bunker at the entrance to the airport. Although intelligence reported ZPU-4's at T/T, they were not present. At 0103 hours, the airborne assault to seize T/T commenced with simultaneous drops on both runways.⁸⁶

A well prepared crossload plan of the sixteen aircraft inserted the reinforced Ranger Battalion in less than three minutes. A/1-75 and C/1-75 met little opposition at Tocumen and discovered the 2d Inf. Co. had dispersed without issuing weapons. B/1-75, after derigging their vehicles, met resistance from the PDF guard posts located on the perimeter of the airfield. B/1-75 quickly overpowered these positions and established their assigned blocking positions to seal off the airfield. Execution proceeded flawlessly except for complications in C/3-75's sector.⁸⁷

Intelligence indicated the airport terminal would be empty at H-Hour. However, moments before the invasion, two international flights arrived and offloaded passengers. C/3-75 found a terminal congested with civilians and numerous soldiers from the 2nd Inf. Co. C/3-75 secured the facility with eight enemy KIA's, 54 PW's, while safeguarding 374 civilians. The use of loudspeaker teams

was instrumental in controlling noncombatants and defusing a potential hostage situation.⁸⁸

The 1st Brigade, 82d Airborne Division was scheduled to reinforce the airhead at H+45. Bad weather and ice delayed the initial follow-on force until H+59, and the remainder of the Brigade did not arrive until 0515 hours. The key mission for the 82d was to relieve a Special Forces team at Pecora Bridge, the critical chokepoint between T/T and Fort Cimarron. It was essential that Pecora Bridge be held to prevent Bn 2000 from counterattacking the airhead.⁸⁹

The delay of the 82d left TF Black, composed of a team from A Company, 3d Battalion, 7th Special Forces Group, alone on Pecora Bridge. TF Black's primary mission was surveillance, but when Bn 2000 approached the bridge, the team effectively interdicted its movement. Stopping the lead vehicle with antitank fire, the team directed an AC-130 against the enemy column to destroy nine vehicles and disperse the oncoming enemy battalion.⁹⁰

At 0700 hours the 1st Ranger Bn was attached to TF Pacific which assumed responsibility for T/T. At H+11 hours, the 7th Infantry Division (Light) began airland operations at T/T to reinforce clearing operations in Panama City.⁹¹ If the seizure of T/T was not "the key to the country," it was certainly an important "key" in the success of the overall operation.

The seizure of T/T was essential to Operation Just Cause. The scope of the operation required to achieve the "Coup de Main" effect exceeded the support capacity of Howard AFB. The large number of various aircraft, refueling requirements, and arriving CONUS forces, made the seizure of T/T an operational imperative.

Although Panama was a developed theater with a large American presence, the seizure of T/T was conducted as a forced entry operation. The 1st Ranger Battalions' plan focused on the rapid introduction of forces directly onto the decisive point by forced entry. The synchronization of the four components of combat power produced overwhelming combat power relative to the enemy force. Speed, shock, and tactical surprise were all ingredients of the successful operation.

Maneuver

Speed was a key element in the seizure and rapid introduction of combat power. The slow buildup in Crete and Grenada was linked to the necessity to clear a runway for follow-on forces. The Rangers airdropped their vehicles with the mainbody. This provided additional firepower and antitank capability, and the mobility to rapidly establish blocking positions to seal off the objective. The decision to airdrop the follow-on forces allowed for the immediate reinforcement of the Rangers regardless of the runway's status.

The crossload plan supported the ground maneuver. The entire assault force was on the ground in less than three minutes achieving mass and shock effect. The crossloading insured that the assault units landed in the immediate vicinity of their objectives. Instead of an assembly plan, the Rangers assembled on the move, which further enhanced the speed, mass, and shock effect on the enemy. The plan hoped to achieve a force ratio of three to one; however, the assault force probably enjoyed an eight to one advantage during the actual assault.⁹²

Firepower

The synchronization of fires with maneuver was another combat multiplier in the operation. Pre-assault fires from the AC-130 and attack helicopters were instrumental in eliminating potential sources of enemy resistance. Air superiority and the suppression of enemy air defenses is paramount for the success of an airfield seizure. Although air defense weapons were not present at T/T, they were a priority target for the AC-130.

The AC-130 provided responsive and accurate fires in support of the Rangers on the ground. Moments after landing, the battalion commander authorized the engagement of moving vehicles between the Torrijos and Tocumen runways. However, the intent of Operation Just Cause was not to destroy, but save a country. The rules of engagement limited the type of munition and the targets that could be engaged. Joint task force level approval was required for the use of artillery and air strikes. To protect civilian lives and airport facilities, stringent rules of engagements were in applied. This required extreme discipline and judgment from every Ranger. However, the limitations on the use of fire can adversely impact on the protection of the force.

Protection

In Grenada the fires of the AC-130 provided the primary protection for the force. The AC-130 provided significant protection for the force in Panama with pre-assault fires and the interdiction of Bn 2000 at Pecora Bridge. But in close combat, the rules of engagement and the protection of the force came into conflict.

The use of loudspeaker teams from the 4th Psychological Operations Group (POG) was one solution to this problem. At several critical points in the operation, enemy defenders were contacted

(in Spanish) by the loudspeaker teams and ordered to surrender. This proved very effective, particularly inside the terminal building. If the enemy refused to surrender, a controlled, but extremely lethal, burst of fire was directed against them, stopped, and the process was repeated each time increasing the amount of firepower applied. This ended many confrontations in surrender instead of a firefight.⁹³

The isolation of the objective area provided protection and time to transition to the defense. The airdropped vehicles played a key role in rapidly establishing blocking positions on the main avenues of approach into the airhead. TF Black's effective interdiction of Bn 2000 at Pecora bridge prevented a counterattack against the airfield during the vulnerable consolidation phase. The simultaneous strikes throughout Panama also provided indirect protection by fixing PDF forces that could have counterattacked the seizure operation.

Despite the PDF's prior knowledge of the invasion, tactical surprise was obtained at T/T. Neither runway was blocked and the 2d Infantry Company's weapons were still in their arms room. Noriega narrowly escaped capture when his visit to Tocumen was unexpectedly shortened by the Ranger's assault. Needless to say, the dictator would not have been there if he had knowledge of the attack.⁹⁴

Tactical Surprise provided a level of protection that was not enjoyed at Crete or Grenada. Unlike Crete, close air support and aerial fires can be delivered without sacrificing the protection of a night airborne assault. Special operation aircraft are capable of delivering paratroopers with pinpoint accuracy without

lights or ground assistance. This "blacked out" delivery technique, combined with a drop altitude of 500 ft., allowed the Rangers to quickly close on their objectives before the enemy had the knowledge or observation to place effective fires.

Leadership

Leadership during the operation was influenced by two factors. First, the leadership effect of the enemy was negligible. During interrogation, MAJ Gayten, PDF, admitted that "the whole infrastructure of our PDF forces was destroyed in the first hour."⁹⁵ Without the most significant element of combat power, the enemy's resistance was token at best.

Prior planning and rehearsals had a significant influence on the leadership effect. The chain of command problems experienced in Grenada were addressed and resolved months before the battle. Wargaming the plan allowed leaders to develop branches and sequels at all levels which prevented the crisis situations of previous airfield seizures. The rehearsals were instrumental in preparing each leader and subordinate unit to perform their assigned missions and verify the synchronization of the plan.

During execution, small unit leaders knew their mission and performed in a decentralized manner. Commander's intent was understood by every Ranger and provided direction and guidance throughout the battle as squad leaders adapted to the changing situation to accomplish their mission. Although a redundant system of a variety of radios provided continuous communication throughout the operation, senior leader control and FRAGO's were not required.

Conclusion

The forced entry seizure of T/T represents over forty years of study, training, and force development. Student's errors and the "fog and friction" of Urgent Fury were corrected during Operation Just Cause. COL(P) William F. Kernan, Commander of the 75th Ranger Regiment during Operations Just Cause, summarized the operation as follows:

Panama validated our training programs and our contingency plan, as well as confirm our focus. The massing of fires (direct and supporting fires), coupled with the synchronization of maneuver, allowed us to generate overwhelming combat power and exploit the tactical surprise we were able to achieve. After the parachute drop, it was essential to assemble the force as we moved toward the objectives, in order to keep the pressure on the enemy, maintain the tempo, and disrupt the enemy's efforts to organize a defense. The Rangers eliminated resistance as they encountered it, pressing aggressively toward their assigned assault objectives. Objectives were deliberately and systematically attacked. Controlled aggression, coupled with violence of action, ensured our success and minimized our casualties. The small unit leaders made it happen. They knew what needed to be done and did it.⁹⁶

COL(P) Kernan's summary of Operation Just Cause is an equally valid synopsis of the key determinants for a successful forced entry airfield seizure.

Conclusions

The global threat to United States' interest requires increased emphasis in the execution of contingency operations. When a secure lodgment area is provided by a host nation, the initial buildup of combat power is simply an exercise in strategic mobility. However, in a nonpermissive or hostile environment, the projection of combat power requires the forced entry seizure of a suitable lodgment area for the introduction of follow-on forces. Many of our current OPLANs rely upon the seizure of an airfield to provide the required lodgment area.

In this context, the airfield is the classical Jominian strategic decisive point. The success or failure of the entire operation depends upon the seizure of the airfield. Therefore, it is critical for a contingency force to understand the key elements for the successful seizure of an airfield.

Like any engagement, the seizure of an airfield is accomplished by generating overwhelming combat power at the decisive point. However, a forced entry airfield seizure is unlike any other engagement. The vulnerability of the force, the special employment of firepower, and the integration of speed, shock, and surprise require a unique synchronization of the four elements of combat power.

Maneuver

Maneuver effect is maximized by using the speed, shock, and surprise of strategic maneuver directly onto the airfield. This denies the enemy the advantage of time and terrain. The assault force must analyze the targets within the airfield complex and tailor their task organization accordingly. Dominant terrain around the airfield must always be a priority objective. The integration of vehicles into the assault force improves mobility and speeds the security process. However, firepower provides the critical element for the support of maneuver.

Firepower

Firepower enhances the maneuver and provides protection for the force. Normally, firepower will be provided by Air Force aircraft, but naval air, special operation aircraft, and even artillery can be utilized. Enemy air defense and indirect fire assets must be the priority target. Once destroyed, firepower can

suppress targets in support of maneuver. However, to prevent damage to the airfield, rules of engagement must limit firepower effects. This is why the AC-130 is the weapon of choice for this operation. In addition its surgical accuracy, the AC-130 is an excellent intelligence source prior to the assault, and during consolidation. Its ability to detect and interdict counterattacking forces, isolates the objective and protects the force as well as the operational condition of the airfield.

Protection

In addition to firepower, protection is a function of surprise, speed, and intelligence. While strategic surprise is unlikely, tactical surprise is essential to deny the enemy the advantage of time. Execution during the hours of darkness enhances surprise and further degrades the enemy's combat power effect. The rapid transition to the defense provides the protection of the theoretically superior form of war. Expansion of the airhead is necessary to protect the airfield and prevent the interdiction of follow-on forces. Protection is also a function of detailed and accurate intelligence. The restrictive rules of engagement and the vulnerability of the force increases exposure to the enemy's combat power effects. Detailed and accurate intelligence is required to locate, prioritize, and destroy enemy targets to protect the force and the airfield.

Leadership

Leadership is the key determinant for the successful seizure of an airfield. The leader must develop a simple and flexible plan which can be violently executed within the enemy's decision cycle. The decentralized nature of the operation requires the

dissemination of the commander's intent to every Ranger. Rehearsals are critical to validate the plan. During execution, redundant communication is essential to provide the leader control and influence over the battle. However, his greatest influence over the battle. However, his greatest influence is the synchronization of maneuver, firepower, and protection to generate overwhelming combat power, relative to the defender's, to seize and secure "the key to the country."

IMPLICATIONS

"Victory won by a sneaky few over the unsuspecting many has been a source of fascination since warriors first told stories around camp fires."⁹⁷

Airfield seizures are often looked upon as "a source of fascination" that can only be conducted "by a sneaky few." This perception is wrong.

First, an airfield seizure is a deliberate attack against a fixed target. The same IPB, METT-T analysis, and battlefield operating systems that are used to plan any battalion deliberate attack, are equally applicable for an airfield seizure. "Our basic 'How to fight' doctrine and FM 100-5 do apply."⁹⁸

The seizure of an airfield is not a mission that is limited to the "sneaky few." Any force structure that is capable of conducting an assault to seize key terrain is capable of seizing an airfield. Based on the situation, airborne, air assault, light infantry, and heavy forces are all capable of seizing and securing an airfield. The only limitation is the means of introducing the force.

However, an assault force can only secure the airfield for a limited period of time. Follow-on forces must rapidly reinforce the airhead. Based on the threat, the follow-on force could be a

heavy, light, or mix. The synchronization necessary for the success of a contingency operation requires both the assault force, as well as the follow-on force, be "trained to standard."

As the military transitions to a contingency force, our training focus must also change. Airfield seizure should be added to the Mission Essential Task List (METL) for all units designated for contingency operations that require airfield seizures - either as assault or follow-on forces. Doctrine and TTP's require development to provide a framework for training the entire force instead of the "sneaky few." The Combat Training Centers should continue to use the scenario developed for the National Training Center Rotation 90-3 (NTC 90-3) to train the force. This rotation began with the seizure of an airfield by a forced entry package that was rapidly reinforced with a heavy/light task force. This is truly "train(ing) as we intend to fight."

FIGURE A: THE RELATIVE COMBAT POWER MODEL

$$L_f (F_f + M_f + P_f - D_e) - L_e (F_e + M_e + P_e - D_f) = \text{THE OUTCOME OF BATTLE}$$

L_f - Friendly Leadership Effect

M_f - Friendly Maneuver Effect

F_f - Friendly Firepower Effect

P_f - Friendly Protection Effect

D_e - Enemy degrading of friendly firepower, maneuver, and protection effects.

L_e - Enemy Leadership Effect

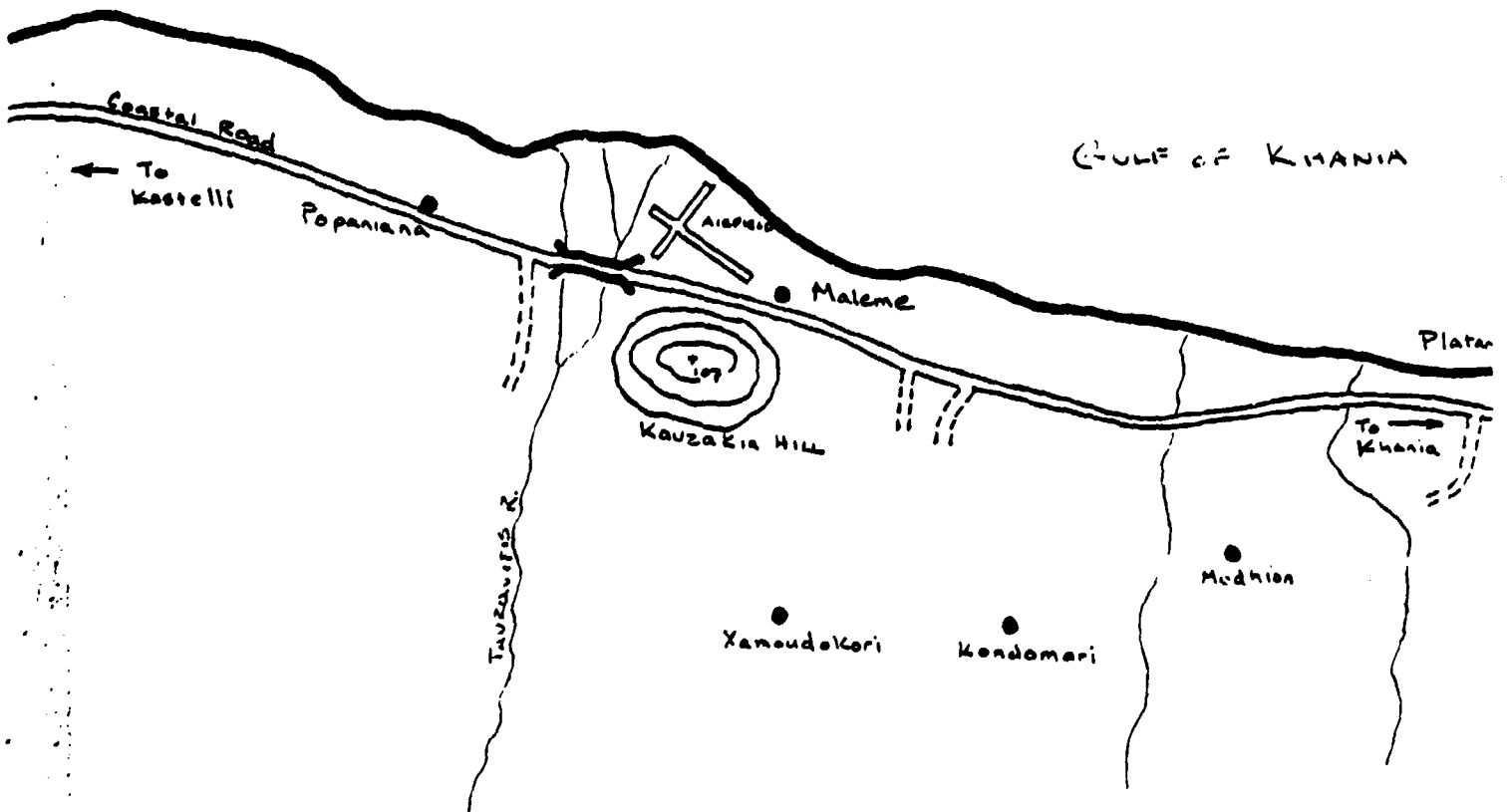
F_e - Enemy Firepower Effect

M_e - Enemy Maneuver Effect

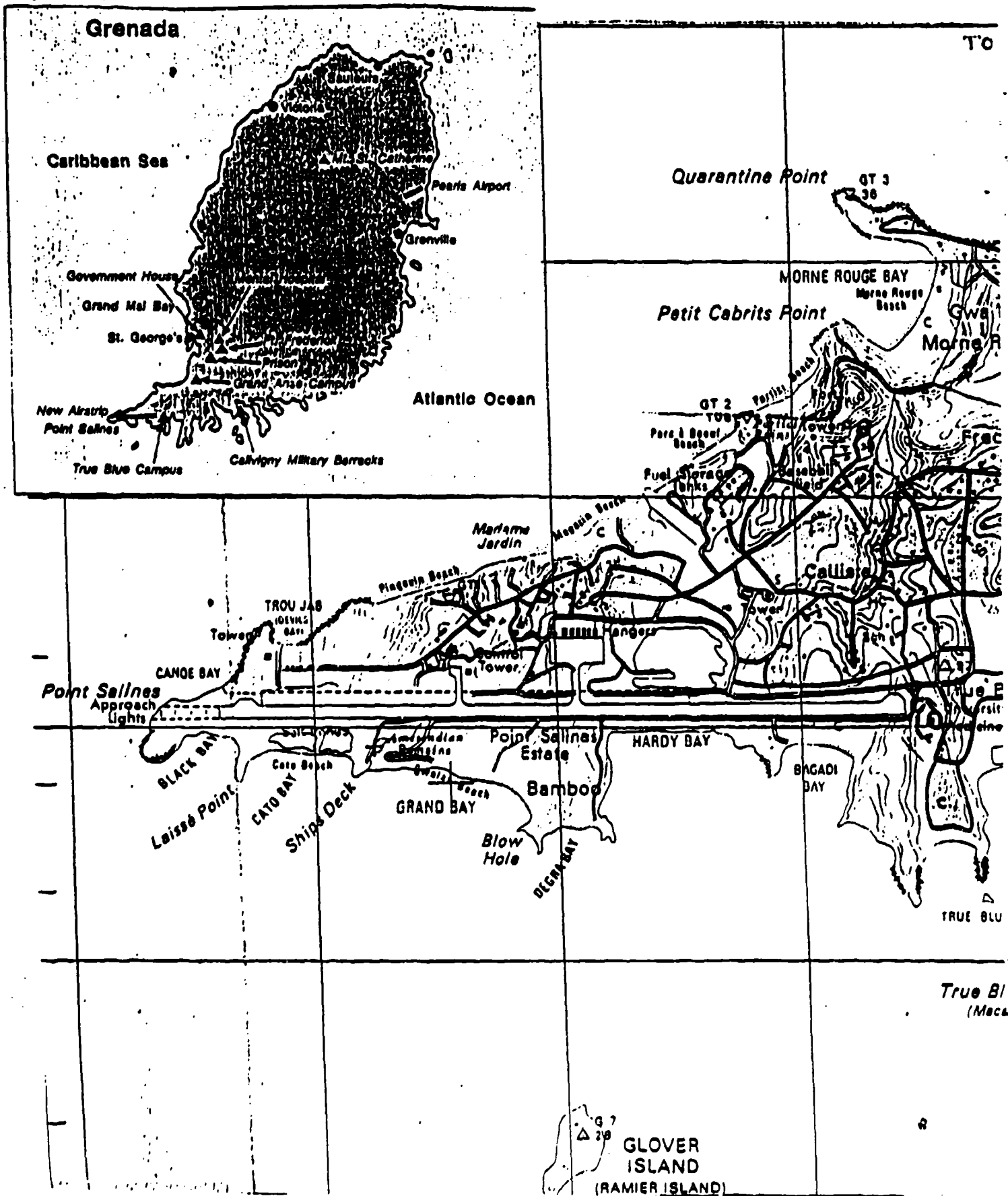
P_e - Enemy Protection Effect

D_f - Friendly degrading of enemy firepower, maneuver, and protection effects.

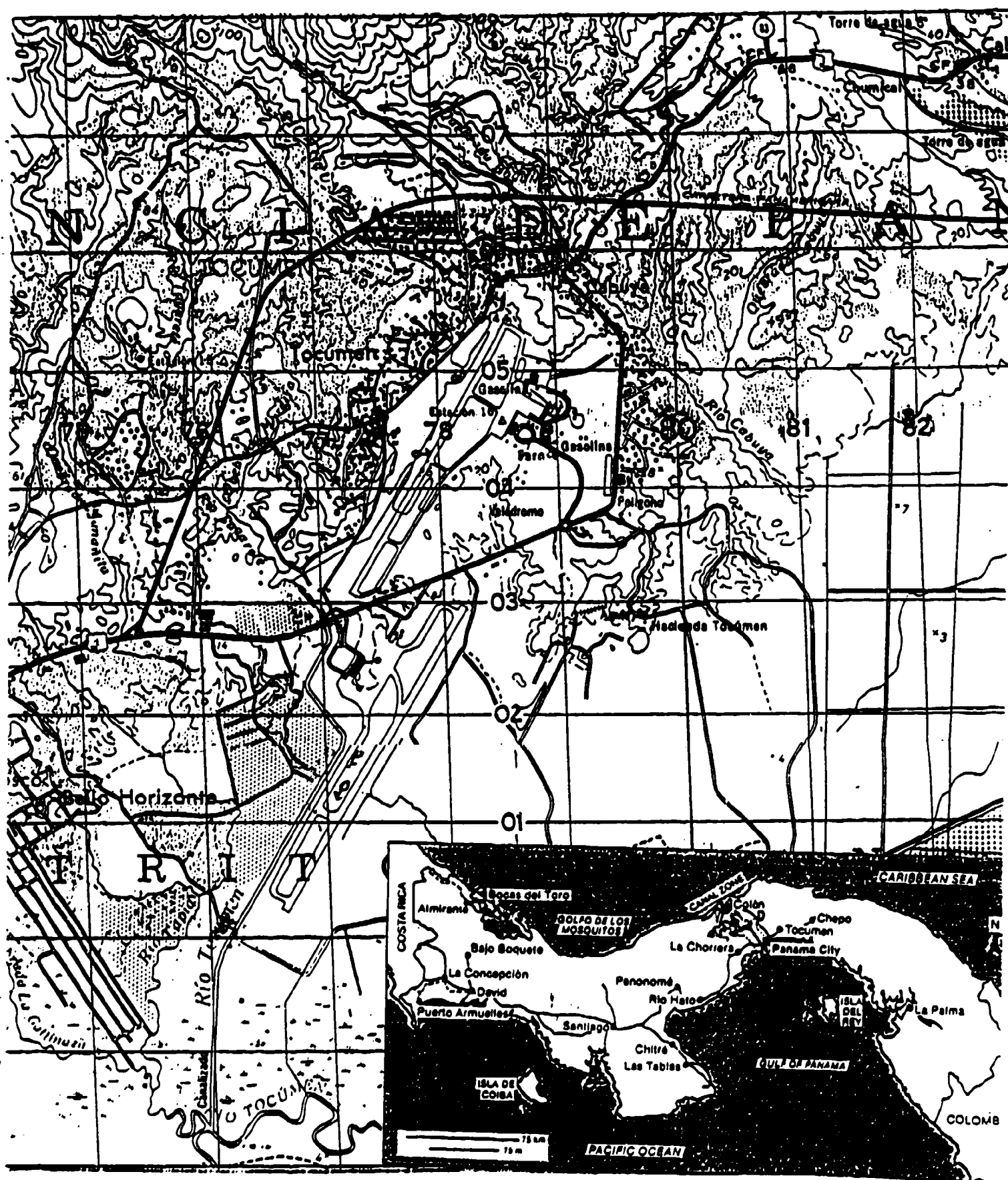
The equation states that the outcome of battle depends upon the difference in the combat power of the antagonist. It further states that combat power is the result of what leaders do with the firepower, maneuver, and protection capabilities of their units. It also states that combat power is affected by the efforts on the part of the antagonist to degrade the combat capabilities of the other while attempting to minimize the effects of such action on their own combat capabilities.⁹⁹



Map B: Operation Urgent Fury - Point Salines Airfield.101



Map C: Operation Just Cause - Torrijos - Tocumen Airfields. 102



ENDNOTES

1. "Parachute Assault," International Defense Review, (April 1989), p. 413. The quote is from an interview with MG James H. Johnson, CG, 82d Airborne Division.
2. Carl von Clausewitz, On War, trans. by Michael Howard and Peter Paret, (Princeton, 1984), p. 456.
3. FM 100-15, Corps Operations, (Washington, DC, 1989), Chapter 8.
4. FM 90-XX (Initial Draft), Airborne Operations, (Fort Benning, 1990), Chapter 3 and Appendix G.
5. Clausewitz, p. 456.
6. Jomini, Antoine Henri, The Art of War, ed., by BG J.D. Hittlein Roots of Strategy Book 2, (Harrisburg, 1987).
7. Ibid., p. 467.
8. Ibid., p. 535.
9. Ibid., p. 358.
10. Handel, Michael I., ed. Clausewitz and Modern Strategy, (London, 1986), p. 139, and Clausewitz, p. 360.
11. Nightingale, COL Keith M., Letter, 25 August 1990.
12. Clausewitz, p. 360.
13. Ibid.
14. Ibid., p. 531.
15. Ibid., p. 198.
16. Ibid.
17. Ibid., p. 199.
18. Jomini, p. 513.
19. Clausewitz, p. 198.
20. Ibid., p. 194.
21. FM 100-5, p. 11.

22. Wass de Czege, COL Huba, "Understanding and Developing Combat Power." (Fort Leavenworth, 1984), p. 12.
23. Ibid., p. 12; FM 100-5, Operations, (Washington, DC, 1986) p. 11-14. Note - Both Wass de Czege and FM 100-5 define a second component of protection which "includes the actions to keep soldiers healthy and maintain their fighting morale. . . guarding equipment and supplies from loss and damage." Because of the short duration of an airfield seizure operation, this component is not applicable to this study.
24. Wass de Czege, p. 15.
25. Kiriakopoulos, G.C., Ten Days to Destiny, (New York, 1985), p. 50.
26. Tugwell, Maurice, Airborne to Battle, (London, 1971), p. 85.
27. Kiriakopoulos, p. 82.
28. Tugwell, p. 83.
29. Kiriakopoulos, p. 55.
30. Ibid., p. 164.
31. Ibid., p. 112-129.
32. JCS Pub. 1, Department of Defense Dictionary of Military and Associated Terms, (Washington, D.C., 1989), p. 18; FM 101-5-1, Operational Terms and Symbols, (Washington, D.C., 1985), p. 1-3; The reader should not confuse this term with AirLand in the context of AirLand Battle Doctrine. In the context of this monograph, airland is defined as "moved by air and disembarked, or unloaded, after the aircraft has landed" at the designated destination.
33. Ibid., p. 157-160.
34. Ibid., p. 189.
35. Tugwell, p. 103 and Kiriakopoulos, p. 164, 203.
36. FM 100-5, p. 12.

37. Note - It may appear that inserting undetected and moving overland to seize the airfield is a valid option. This is normally not an option for two reasons. First, inserting the force undetected can be not be guaranteed. Second, it does not minimize the enemy's advantage of time and terrain. Time is seldom available in a contingency operation for this option. This returns to my original statement that the forced entry must be made directly onto the airfield.

38. Clausewitz, p. 357.

39. FM 100-5, p. 12.

40. Tugwell, p. 83.

41. Kiriakopoulos, p. 109.

42. Ibid., p. 172.

43. Ibid., p. 193.

44. Tugwell, p. 83.

45. Lucas, James, Storming Eagles, (London, 1988), p. 57.

46. Tugwell, p. 115.

47. Kiriakopoulos, p. 114-160.

48. Kiriakopoulos, p. 167.

49. Kiriakopoulos, p. 236.

50. Bolger, CPT Daniel P., Americans At War, (Novato, 1988) p. 269.

51. Burrowes, Reynold A., Revolution and Rescue in Grenada, (New York, 1988), p. 79.

52. Dunn, Peter M., ed., American Intervention in Grenada, (Boulder, 1985), p. 101; Bolger, p. 292.

53. Bolger, p. 294.

54. Adkin, MAJ Mark, Urgent Fury, (Lexington, 1989), p. 198.

55. Bolger, CPT Daniel P., "Operation Urgent Fury and Its Critics," Military Review, (July 1986), p. 60. Sources still disagree on the exact strength as this author indicates. Estimates range from 3200 to 7000.

56. Hogan, David W., Evolution of the Concept of the U.S. of the U.S. Army Ranger 1942-1983, (Duke University, 1986), p. 531; Adkin, p. 170, 198; Bolger, p. 301.
57. "Jumping Into a Hot DZ: Grenada '83," Defence Update, (#46, 1984), p. 233; Bolger, p. 307-308.
58. Bolger, CPT Daniel P., "Special Operations in the Grenada Campaign," Parameters, (December, 1988), p. 58; Adkin, p. 214.
59. Gabriel, Richard A., Military Incompetence, (New York, 1985), p. 163-164; Bolger, p. 311.
60. Adkin, p. 217-223; Bolger, p. 311-313.
61. Ibid., p. 223; Bolger, p. 314-316; Zeybel, p. 54.
62. Musicant, Ivan, The Banana Wars, (New York, 1990), p. 385; Adkin, p. 229.
63. Bolger, Parameters, p. 53; Bolger, Military Review, p. 64.
64. Crocker, LTC George A., "Grenada Remembered," (USAWC, 1987), p. 5; Schemner, Benjamin F., "JCS Reply to Congressional Reform Caucus' Critique of the Grenada Rescue Operation," Armed Forces Journal International, (July 1984), p. 14.
65. Stack, Cecil, "Grenada," Soldiers, (Jan 1984), p. 39; Zeybel, Henry, "Gunships at Grenada," National Defense, (February 1984), p. 53-56.
66. Crocker, p. 9, LTC Crocker commanded 1st Bn (ABN) 505th INF during operation Urgent Fury.
67. Adkin, p. 217; Dunn, p. 103.
68. Bolger, p. 311, Schemner, p. 18.
69. Adkin, p. 226.
70. "Jumping Into a Hot DZ: Grenada '83," p. 30.
71. Adkin, p. 334.
72. Nightingale, Letter, Commander, 2d Bn (ABN) 505th IN during Operation Urgent Fury and former Commander of 1st Ranger Battalion.
73. Hogan, p. 535.

74. Musicant, p. 395.
75. Ibid.
76. Ibid., p. 396.
77. Watson, Russell, "Invasion," Newsweek, (1 Jan 1990), p. 16.
78. Musicant, p. 396; Keller, CPT(P) Brian A., Interview. CPT(P) Keller served as the 1st Ranger Battalion S-2 during Operation Just Cause.
79. Musicant, p. 401.
80. Cole, MAJ Thomas A., Interview. MAJ Cole served as the 1st Ranger Battalion LNO during Operation Just Cause; Keller.
81. Keller.
82. Mitchell, LTC John, Interview. LTC Mitchell served as the 1st Ranger Battalion XO during Operation Just Cause; Keller; Cole.
83. Cole; Keller.
84. Cole.
85. Keller.
86. Hughes, David, "Night Invasion of Panama Required Special Operation Aircraft, Training," Aviation Week and Space Technology, (19 Feb 1990), p. 61-65; Keller.
87. Cole; Keller.
88. Soldiers in Panama, (Washington, 1990), p. 8; Keller.
89. Steele, Dennis, "Operation Just Cause," Army, (February 1990), p. 40; Keller.
90. Soldiers in Panama, p. 14-15, Musicant, p. 402-403.
91. Cole; Keller; Soldiers in Panama, p. 8-9.
92. Kernan, COL(P) William F., Interview. COL(P) Kernan served as commander of the 75th Ranger Regiment during Operation Just Cause.
93. Barry, John and Douglas Waller, "Inside the Invasion," Newsweek, (25 June 1990), p. 29; Cole; Keller.

94. "The Architect of 'Just Cause'," p. 18; Keller; Cole.
95. Church, George J., "No Place to Run," Time, (8 January 1990), p. 43.
96. Kernan.
97. Sweetman, Bill, "Air Support for Special Operations," Intervista, (February 1989), p. 133.
98. Taylor, BG Wesley B., Jr., Letter. BG Taylor served as the commander of the 1st Ranger Battalion during Operation Urgent Fury and commanded the 75th Ranger Regiment during the early planning for Operation Just Cause.
99. Wass de Czege, p. 15.
100. Kiriakopoulou, p. 200; The sketch of the Maleme Airfield sector was made by the author from the schematic drawing that appears in the book.
101. Grenada South, edition 1-DMA, series E8416; sheet 2, 1983 scale 1:25,000.
102. Pedregal, edition 2-DMA, series E762; sheet 4343 111, 1988, scale 1:50,000.

BIBLIOGRAPHY

Books

Adkin, Mark. Urgent Fury. Lexington, Mass: Lexington Books, 1989.

Behar, David S. and Godfrey Harris, ed., Invasion. Los Angeles, CA: The Americas Group, 1990.

Blair, Clay. Ridgeway's Paratroopers. New York: The Dial Press, 1985.

Bolger, CPT Daniel P., Americans at War. Novato, CA: Presidio Press, 1988.

Bradford, Ernle. Siege Malta 1940-1943. New York: William Morrow and Company, Inc., 1986.

Burrowes, Reynold A. Revolution and Rescue in Grenada. New York: Greenwood Press, 1988.

Clausewitz, Carl von. On War. Edited and translated by Michael Howard and Peter Paret. Princeton: Princeton University Press, 1984.

de Ste Croix, Philip, ed. Airborne Operations. London: Salamander Books Ltd., 1978.

Devlin, Gerard M. Paratrooper. New York: St Martin's Press, 1979.

Dunn, Peter M. and Bruce W. Watson, ed. American Intervention in Grenada. Boulder, CO: Westview Press, 1985.

Edwards, Roger. German Airborne Troops. New York: Doubleday and Company, Inc., 1974.

English, John A. On Infantry. New York: Praeger Publishers, 1984.

Gabriel, Richard A. Military Incompetence. New York: Hill and Way, 1985.

Handel, Michael I., ed. Clausewitz and Modern Strategy. London: Frank Cass and Company, Ltd., 1986.

Hogan, David W. "The Evolution of the Concept of the U.S. Army's Rangers, 1942-1983." Diss. Duke University, 1986.

Jomini, Antoine Henri. The Art of War." Roots of Strategy. Book 2. Ed. BG J.D. Hittle. Harrisburg PA: Stackpole Books, 1987.

Jones, Kenneth. The Enemy Within.. Casting Out Panama's Demon. El Dorado, Panama: Focus Publications International, 1990.

Kiriakopoulos, G.C. Ten Day to Destiny. New York: Avon Books, 1985.

Lucas, John. Storming Eagles. London: Arms and Armor Press, 1988.

Musicant, Ivan. The Banana Wars. New York: MacMillan Publishing Company, 1990.

O'Shaughnessy,, Hugh. Grenada, Revolution, Invasion, and Aftermath. London: Sphere Books, Ltd., 1984.

Tugwell, Maurice. Airborne to Battle. London: William Kimber and Company, Ltd., 1971.

Articles

Auchincloss, Kenneth. "Americans at War." Newsweek, 7 Nov 1983: 52-58.

Auster, Bruce B. "Military Lessons of the Invasion." U.S. News and World Report, 8 Jan 1990: 22-23.

Bolger, CPT Daniel P. "Operation Urgent Fury and Its Critics." Military Review, Jul 1986: 57-69.

Bolger, CPT Daniel P. "Special Operations in the Grenada Campaign." Parameters, Dec 1988: 49-61.

Boylan, COL Peter J. "Power Projection, Risk, and the Light Force." Military Review, May 1982: 62-69.

Church, George J. "No Place to Run." Time, 8 Jan 1990: 38-43.

Cragg, Dan. "U.S. Army in Grenada." Army, Dec 1983: 29-31.

Crocker, LTC George A. "Grenada Remembered." USAWC Essay, March 1987.

Donnelly, Tom. "Victory in Panama." Army Times. 15 Jan 1990: 11, 14.

Finegan, Jay. "Jumping Into a Hot DZ at 500." Army Times.
14 Nov 1983: 1-2, 10, 66.

Flanagan, E.M. "The German Airborne Invasion of Crete." Army, March 1990.

Hirst, Don. "U.S. Troops Pursue Cubans in Grenada." Army Times, 7 Nov 1983: 1, 16-18.

Hughes, David. "Night Invasion of Panama Required Special Aircraft, Training." Aviation Week and Space Technology, 19 Feb 1990: 61-65.

"Jumping Into a Hot DZ, Grenada '83." Defence Update, Vol. 46, 1984: 25-37.

Kufus, Marty. "U.S. Special Operations KIA's in Grenada." Strategy and Tactics, Apr-May 1984: 40-44.

Luttwak, Edward. "Just Cause: A First Look at Intervention." Army Times, 1 Jan 1990: R7.

Luttwak, Edward and Tom Donnelly. "Operation Just Cause, Critique and Reply." Parameters, March 1990: 100-102.

Magnuson, Ed. "D-Day in Grenada." Time, 7 Nov, 1983: 22-28.

Magnuson, Ed. "Sowing Dragon's Teeth." Time, 1 Jan 1990: 24-27.

Maryuchin, COL P. "Soviet Units in the Capture of an Airfield." Truppendienst, Jan 1984.

McConnell, Malcolm. "The Measure of a Man." Reader's Digest, Oct 1990: 61-67.

"Parachute Assault." International Defense Review, April 1989: 413-415.

Rivard, MAJ David T. "An Analysis of Operation Urgent Fury." Air War College Research Project, April 1985.

Schemner, Benjamin F. "JCS Reply to Congressional Reform Caucus' Critique of the Grenada Rescue Operation." Armed Forces Journal International, Jul 1984: 12-18, 99.

Shani, COL Joshua, IAF. "Airborne Raids." Air University Review, Mar-Apr 1984: 41-51.

Stack, Cecil. "Grenada." Soldiers, Jan 1984: 37-44.

Steele, Dennis. "Operation Just Cause." Army, Feb 1990: 34-44.

Sweetman, Bill. "Air Support for Special Operations." Interavia, Feb 1989: 133-136.

"The Architect of 'Just Cause'." Army Times, 12 Mar 1990: 14-15, 18, 68.

"Ten Days of Urgent Fury." All Hands, May 1984: 18-37.

Waller, Douglas and John Barry. "Inside the Invasion." Newsweek, 25 Jun 1990: 28-31.

Watson, Russell. "Invasion." Newsweek, 1 Jan 1990: 12-22.

Whitaker, Mark. "The Battle for Grenada." Newsweek, 7 Nov 1983: 66-76.

Zeybel, Henry. "Gunships at Grenada." National Defense, February 1984: 53-56.

Field Manuals

FM 7-85, Ranger Operations. Washington, DC: HQ Department of the Army, 1987.

FM 90-XX (Initial Draft), Airborne Operations. Ft Benning, GA.: (United States Army Infantry School, 1990.

FM 100-5, Operations. Washington, DC: HQ Department of the Army, 1986.

FM 100-15, Corps Operation. Washington, DC: HQ Department of the Army, 1986.

FM 100-20 (Final Draft), Military Operations in Low Intensity Conflict. Washington, DC: HQ Department of the Army 1989.

FM 101-5-1, Operational Terms and Symbols. Washington, D.C: HQ Department of the Army, 1985.

JCS Pub. 1, Department of Defense Dictionary of Military and Associated Terms. Washington, D.C.: The Joint Chiefs of Staff, 1989.

Government Publications

Operation Urgent Fury(S). Washington, DC: U.S. Army Center of Military History, 1986.

OPLAN GIANT. Ft Bragg, NC: HQ 82d Airborne Division, 1987.

Schambach, MAJ Paul D. "Operation Just Cause: Intelligence Operations and Insights." Ft Bragg, NC: HQ 82d Airborne Division, 10 May 1990.

Soldiers in Panama. Washington, DC: HQ Department of the Army, 1990.

Strike Operations Handbook for Commanders(Draft). Ft Leavenworth, KS: CTAC-CGSC, 23 Mar 1990.

TACSOP. Ft Benning, GA.: HQ 75th Ranger Regiment, 1987.

TACSOP. Ft Bragg, NC: HQ 2d BN 505th Parachute Infantry Regiment, 1986.

Urgent Fury: USAF and the Grenada Operation(S/NOFORN). Scott Air Force Base: HQ Military Airlift Command, March 1989.

Wass de Czege, COL Huba. "Understanding and Developing Combat Power." Ft Leavenworth, KS.: USACGSC, 10 Feb 1984.

Letters and Interviews

Cole, MAJ Thomas A. Personal Interview. 3 Nov 1990.

Crawford, COL Howard W. Letter to CPT Gordon C. Bonham. 24 Aug 1990.

Keller, CPT(P) Brian A. Personal Interview. 30 Sep 1990.

Keller, CPT(P) Brian A. Personal Interview. 18 Nov 1990.

Kernan, COL(P) William F. Informal Discussion. 17 Oct 1990.

Kernan, COL(P) William F. Letter to CPT Gordon C. Bonham. 17 Aug 1990.

Kernan, COL(P) William F. Letter to MAJ Gordon C. Bonham. 6 Nov 1990.

Mitchell, LTC John M. Personal Interview. 3 May 1990.

Nightingale, COL Keith M. Letter to CPT Gordon C. Bonham. 7 Jan 1990.

Nightingale, COL Keith M. Letter to CPT Gordon C. Bonham. 25 Aug 1990.

Taylor, BG Wesley B., Jr. Letter to CPT Gordon C. Bonham. 4 Sep 1990.

**END
FILMED**

DATE: 4-91

DTIC