

Geronimo: Planning Considerations for Employing Airborne Forces

A Monograph

by

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14. ABSTRACT To plan an effective airborne operation, a planner must adhere to joint planning considerations and understand the Air Force and Army requirements. Today the Army maintains only one brigade and two battalions of deployable conventional airborne combat power. The special operations community also is airborne capable, and the 75th Ranger Regiment has three battalions specifically tasked with airfield seizure. The aircraft requirements for airborne operations increased over the decades, now requiring 209-245 C-17s to deploy a brigade and 42-60 C-17s to deploy a battalion. The C-130 is nearly useless in modern deployments except for operations that can be conducted from a local intermediate staging base. Another challenge is enemy advanced air defense systems which renders airborne operations not feasible. Also, in areas where special forces cannot precede the conventional airborne joint forcible entry operation, the campaign is feasible only by assembling a vastly overwhelming force. In countries where an immediate airland is not possible, the airborne formation has limited operational reach. Airdropping paratroopers historically led to injury rates as high as 51.8%. Planning time, often overlooked as a risk mitigation measure in crisis response scenarios, correlates to successful operations. In fact, operations undertaken without 100 or more days of planning lacks proper assembly of an appropriate team to confirm planning assumptions and fail to resource the individual soldiers conducting the operation. Multiple challenges demonstrate the importance of effective planning for airborne operations with doctrine and force requirements.					
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Abstract

Geronimo: Planning Considerations for Employing Airborne Forces, by MAJ Tyler J. Rund, 55 pages.

What planning considerations improve effectiveness for airborne operations in the modern joint environment? Airborne operations remain vital to the US military. The responsiveness airborne forces provide to strategic leaders is unmatched. Furthermore, a joint forcible entry operation outside of the littorals requires airborne forces. This planner's guide explored the joint doctrinal considerations for utilizing airborne forces and the specific force requirements of the Army and Air Force. The analysis draws primarily on two RAND publications and six specific post-World War II airborne operations with a focus on Operation Uphold Democracy conducted in Haiti in 1994.

To plan an effective airborne operation, a planner must adhere to joint planning considerations and understand the Air Force and Army requirements. Today the Army maintains only one brigade and two battalions of deployable conventional airborne combat power. The special operations community also is airborne capable, and the 75th Ranger Regiment has three battalions specifically tasked with airfield seizure. However, only a battalion task force of conventional airborne forces is deployable in many contingencies due to limited intermediate staging bases and Air Force limitations on aircraft and aircrews. The aircraft requirements for airborne operations increased over the decades, now requiring 209-245 C-17s to deploy a brigade and 42-60 C-17s to deploy a battalion. The C-130 is nearly useless in modern deployments except for operations that can be conducted from a local intermediate staging base. Another challenge is enemy advanced air defense systems which renders airborne operations not feasible. Also, in areas where special forces cannot precede the conventional airborne joint forcible entry operation, the campaign is feasible only by assembling a vastly overwhelming force. In countries where an immediate airland is not possible, the airborne formation has limited operational reach. Airdropping paratroopers historically led to injury rates as high as 51.8%. Planning time, often overlooked as a risk mitigation measure in crisis response scenarios, correlates to successful operations. In fact, operations undertaken without 100 or more days of planning lacks proper assembly of an appropriate team to confirm planning assumptions and fail to resource the individual soldiers conducting the operation. These multiple challenges demonstrate the importance of effective planning for airborne operations using doctrine and Army and Air Force requirements.

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Acronyms

A2AD	Anti-Access and Area-Denial
AFB	Air Force Base
AR/AAV	Armored Reconnaissance/Airborne Assault Vehicle
C-RAM	Counter Rocket, Artillery and Mortar
FM	Field Manual
ISB	Intermediate Staging Base
JCS	Joint Chiefs of Staff
LAV-25	Light Armored Vehicle 25mm
MILACAS-FR	Military Aircraft Collision Avoidance System - Formation Rendezvous
NEO	Non-Combatant Evacuation Operation
OPLAN	Operational Plan
RSO&I	Reception, Staging, Onward Movement and Integration
USAF	United States Air Force
WWII	World War Two

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Introduction

I jump by parachute from any plane in flight. I volunteered to do it, knowing well the hazards of my choice... I blaze the way to farflung goals--behind, before, above the foe's front line. I know that I may have to fight without support for days on end. Therefore, I keep mind and body always fit to do my part in any Airborne task. I am self-reliant and unafraid. I shoot true, and march fast and far. I fight hard and excel in every art and artifice of war...

— *The Airborne Creed*

Nothing matches the responsiveness that airborne formations provide to the US military. The global response force relies on this speed to provide an entry option in crises. This analysis provides a guide for planning an effective airborne operation and includes historical examples as illustrations of planning and of successful and unsuccessful outcomes. The planner must understand and adhere to three sets of considerations: joint, Air Force, and Army planning considerations. The doctrinal and service requirements provide a planner with a toolkit for mitigating risk prior to execution of an operation.

First, a planner must examine joint doctrinal considerations and understand the history of using airborne forces and the joint nature of these operations. Two decisions are key: whether to airdrop or airland the force and whether to use coercion or surprise in the operation. Joint doctrine defines how airborne formations as a global response force deploy in two distinct formations: either an airdropped or airlanded joint entry force. Additionally, the airborne formation serves as a global coercion force that can be used to coerce a result or can be employed with complete surprise. Sometimes the mere capability or threat of an airborne operation can deter aggression and avoid conflict altogether. Other times, it is more important to focus on surprise as the critical need for a successful operation. These two criticalities – deciding how to insert the force and deciding whether to rely on coercion or surprise - are the foundational principles in airborne joint forcible entry operations and must be properly evaluated for mission success.

The second set of planning considerations used by a planner to plan an effective airborne operation is the Air Force planning considerations. The Air Force planning considerations involve three factors. The planner must consider the needs related to air transport, including aircraft availability and personnel training required for the specific mission. In addition, anti-access and area denial (A2AD) considerations must be examined and assessed. Advances in adversary weaponry, such as A2AD, raises questions about the feasibility of airborne operations. A third factor is the availability of intermediate staging bases (ISBs). The use of an ISB increases the ability to deliver a larger force while using limited Air Force transportation assets. However, ISBs are not available or not feasible in all scenarios. The use of ISBs relates directly to the mass an airborne force can assemble on its assigned objectives. The planner must analyze each of these planning factors when assessing operational variables for an assigned operation.

Third, a planner must scrutinize the Army planning considerations. Focusing on the ground tactical plan is key. The plan must factor in what ground tactical plan will be executed to determine the type and quantity of assets for the airborne operation. Next, the planner must build the team. The planner must utilize all team members, including interagency or multi-national staff. The third consideration is how much planning time is needed to plan an effective operation. Allowing for sufficient planning time is crucial to a successful plan. Without adequate time provided for planning, operational shortfalls become apparent during execution. The planner also must consider the critical requirements necessary to support ground forces. The plan must include capability enhancements, including reconnaissance, fire support, protection, lethality, sustainment, communication, and mobility enhancement. These Army planning considerations must be evaluated and refined during the planning process and appropriate plans made to address each consideration.

Proper planning for airborne operations is especially important due to the limited capabilities of the conventional airborne force. In fact, the US military's airborne capability has eroded such that it can no longer conduct a brigade-sized airborne joint forcible entry operation in

many contingencies. Conducting a battalion-sized airborne joint forcible entry operation strains capacity. Also, the small force size of the current airborne force and their associated enablers requires concentrating assets from across the globe. Compounding the problem, these global assets no longer train together which increases the risk of the operation.

Research on airborne capabilities and post-World War II airborne operations illustrate the planning considerations in joint doctrine and in Army and Air Force requirements. Two recent research publications conducted by the RAND Institute thoroughly address the issues of both the global response force and an approach to enhancing airborne capabilities. The historical analysis of Operation Uphold Democracy in Haiti provides a comprehensive case study, addressing issues surrounding planning and deploying airborne formations in a joint forcible entry. To widen the scope of the historical review, additional post-World War II operations illustrate the planning considerations discussed in this analysis. These operations include the Dominican Republic (Operation Power Pack), Congo (Dragon Operations), Grenada (Operation Urgent Fury), Panama (Operation Just Cause) and Iraq (Operation Iraqi Freedom). These case studies and research publications provide a frame for understanding and applying these planning considerations.

Vignette: Haiti 1994, Operation Uphold Democracy

On September 30, 1991, a military coup led by General Raoul Cedras overthrew the democratically elected government of Haiti. Various United Nations resolutions resulted in international pressure on the military junta which had assumed power in Haiti. A few military members of the Haitian Armed Forces made a show of force. The *USS Harlan County* then withdrew from Haiti. This embarrassing withdrawal was seen globally as “a few drunk Haitians

forcing a US flag carrying vessel to retreat.”¹ This Haitian aggression prompted President Clinton to escalate to using force.

Planning for operations in Haiti began as a non-combatant evacuation operation (NEO). After the *USS Harlan County* incident, it became evident that more force was necessary to achieve favorable results and return the legitimate ruler, President Aristide, to power. The joint task force used crisis action planning to form the proper response to the Haitian threats. Planning for the operations took place over 253 days once the US administration decided to intervene. The intended nature of the operation changed several times during planning. Only a few planners in an abandoned broom closet in XVIII Airborne Corps headquarters created the plan for the Haiti operation. Also, the operational designation as a compartmentalized project with limited access truly handicapped the planning effort. The invasion plan began as OPLAN 2370, which was a joint 82d Airborne and Special Operations Forces mission. OPLAN 2370 called for 113 transport aircraft to airdrop 3,848 paratroopers across two drop zones. Those units would secure 40 D-day objectives and complete the combat mission in less than forty-five days. After securing the airport in Haiti, 4,500 additional paratroopers would airland and provide the necessary force structure to accomplish all mission objectives.

Due to a changing intelligence picture in Haiti, the Joint Chiefs of Staff (JCS) wanted an option for a permissive entry by US forces. This option became OPLAN 2380, and development of OPLAN 2370 continued. The JCS determined that 179 days called for by OPLAN 2380 was an excessive length of time to commit the 82d Airborne, a national strategic asset. Therefore, the authority for planning OPLAN 2380 transferred to the 10th Mountain Division. Simultaneously with this transfer, the 82d was informed that planning for OPLAN

¹ Walter Kretchik, Robert F. Baumann, and John T. Fishel, *Invasion, Intervention, "Intervasion": A Concise History of the U.S. Army in Operation Uphold Democracy* (Fort Leavenworth: US Army Command and General Staff College, 1998). This source is the basis of the entire vignette concerning Haiti. Epigraph: United States Army Maneuver Center of Excellence, *The Airborne Creed*. Accessed April 10, 2017, <http://www.benning.army.mil/infantry/RTB/1-507th/airborne/content/pdf/Airborne%20Creed.pdf>.

2370 was to change from eight to five airborne battalions and to include Marines for enhanced firepower. As the operational commencement date approached, the JCS amended the operation planning: create an option between the contested entry of OPLAN 2370 and the permissive entry option of OPLAN 2380. This directive resulted in the planning of OPLAN 2375. OPLAN 2375 called for the initial forcible entry by the 82d detailed in OPLAN 2370 but foresaw only two days of ground combat until operations would turn more permissive. The JCS called for enacting OPLAN 2380.

In the fused plan of OPLAN 2375, the 82d would conduct the forcible entry operation. Also, the 10th Mountain would be the reinforcing entry force, conducting operations without the need for the reception, staging, onward movement, and integration (RSO&I) by deploying from a sea base. Friction reigned with two division staffs (10th Mountain and 82d Airborne) planning the same operation but isolated from one another. The planners assessed capabilities of their assigned units and weighed them against probable threats, and as a result, they made decisions about acceptable risk. As the 82d did not have the necessary firepower for commanders to underwrite the risk, they added Marines into the plan. Arguably this was also decided for the sake of creating a joint force. Planners established ground objectives with an understanding of the operational reach of the various formations. Securing an airhead was the key task of the 82d, allowing stronger formations to deploy into the operating environment. Upon the execution order and less than five hours before paratroopers would exit aircraft on Haitian objectives, CNN broadcast the 82d Airborne's combat-loaded departure from Pope Air Force Base which worked as a strategic deterrent. General Cedras agreed to the US terms set by the peace delegation led by former President Jimmy Carter. Lastly, the gamble in providing the enemy with the intelligence of a pending invasion posed a risk to the entry force. However, in the case of Operation Uphold Democracy, the reward was a peaceful entry operation at the cost of sacrificing tactical surprise, had the Haitians resisted the entry forces.

Additional Operations

Operation Power Pack took place in the Dominican Republic between 1965 and 1966.² The operation emerged as a crisis response and as such only had four days of planning. The equivalent of two brigade combat teams deployed, configured to conduct airdrop operations and were ordered while enroute to conduct an airland instead. This operation was hindered with confusion and unclear guidance. Ultimately, the operation met its objectives, yet it more closely resembled a police action rather than large scale combat operations.

Dragon Operations involved hostage rescue operations in the Congo from 1964-1965.³ Paratroopers from Belgium utilized US aircraft. Planning for the operation took place over four days as it was a crisis response operation. In the end, 320 paratroopers conducted the operation. This force size was woefully inadequate, and thus the operations did not meet all their objectives. Surprise was sacrificed in a hope to coerce the hostage rescue without intervention.

Operation Urgent Fury in Grenada in 1983 was the largest US airborne operation post WWII, totaling 5,000 paratroopers.⁴ Grenada became another airborne operation planned as a crisis response with four planning days. Due to the numerous unknown variables involved in the planning, the operation called for a force that was of such strength that there was no opportunity to fail to achieve the mission objectives. The confusion and command issues present in Grenada were the impetus for the improvements that led to future successes in Panama and Iraq.

² Lawrence Yates, *Power Pack: US Intervention in the Dominican Republic, 1965-1966* (Fort Leavenworth: Combat Studies Institute, 1988), 25-160.

³ Thomas Odom, *Dragon Operations: Hostage Rescues in the Congo, 1964-1965* (Fort Leavenworth: Combat Studies Institute, 1988), 55-145.

⁴ Edgar Raines, *The Rucksack War: U.S. Army Operational Logistics in Grenada, 1983* (Washington, DC: Center of Military History, US Army, 2010), Chapter 2-10.

In 1989 the US undertook Operation Just Cause in Panama.⁵ The operation included 3,900 paratroopers. This operation had the advantage of a US staging base inside the country to be invaded. The operation included the only instance of employing the airdroppable Sheridan M551 Light Tank. Operational planning took place over 137 days. The outcome is viewed as a decisive victory for US forces as all operational objectives were met.

In 2003, an airborne operation was necessary to create the northern front for ground operations in the 2003 Iraq Invasion because Turkey denied permission for US ground forces to use its territory for operations.⁶ The denial by Turkey gave planners 23 days to plan the operation. In total, 963 paratroopers conducted an airdrop. Special forces preceded the conventional force and provided critical intelligence and security activities. Following the airdrop operation 12 x C-17s landed per day and brought the force to over 2,160 Soldiers. Limited combat action occurred over the course of the airborne operation.

Section One: Joint Planning Considerations

Doctrinal Role of Conventional Airborne Forces

When planning campaigns, airborne forces provide a niche capability that must be understood to be effectively employed. In crisis response, airborne entry is the most responsive joint forcible entry option, enabling delivery to the objective a battalion in 18 hours or a brigade in 96 hours. Maritime deployments cannot match this response.⁷ The conventional force supplies the capability needed for airborne joint forcible entry. Indeed, the 75th Ranger Regiment can conduct a company airfield seizure; Special Forces can conduct limited seizures. However, the

⁵ Lawrence Yates, *The U.S. Military Intervention in Panama Origins, Planning, and Crisis Management June 1987–December 1989* (Washington, DC: Center of Military History, US Army, 2008), Chapter 5-10.

⁶ Gregory Fontenot, E. J. Degen, and David Tohn, *On Point: The United States Army in Operation Iraqi Freedom* (Fort Leavenworth: Combat Studies Institute Press, 2004), 222-230.

⁷ Flynn, Charles and Joshua Richardson, "Joint Operational Access and the Global Response Force Redefining Readiness," *Military Review* (July 2013), 38-44.

conventional force contributes the structure needed to bring a battalion and brigade-sized element to the objective. This deployable size requires a larger organizational structure to enable rotational ready-status and the necessary support for subordinate units. The conventional force maintains the structure of “it takes three to make one” construct (a division to deploy a brigade and a brigade to deploy a battalion).⁸ Currently, the airborne capability outlined in joint doctrine has no substitute in the US military if conventional airborne formations are eliminated as discussed in some professional publications.⁹

In fact, deploying airborne forces to conduct a joint forcible entry enjoys a long history. In the years following World War Two, the US employed airborne forces five times in a forcible entry role.¹⁰ The US military still recognizes the need for airborne forces and retains the capability, albeit in a limited capacity. Currently, the US Army maintains one division and two independent brigades of conventional airborne forces.¹¹ The 82d Airborne Division has three organic infantry battalions per brigade. The two independent brigades stationed in Alaska and Italy¹², have only two organic infantry battalions and require augmentation to form their third infantry battalion.¹³ Under the construct that it takes a division to deploy a brigade and a brigade

⁸ Marc DeVore, *When Failure Thrives: Institutions and the Evolution of Postwar Airborne Forces* (Fort Leavenworth: Combat Studies Institute Press, 2015), 73.

⁹ DeVore, *When Failure Thrives*; Kyle Jahner, “Does the Army need airborne?” *Army Times*, February 29, 2016.

¹⁰ Thomas Heibert, “82nd Airborne Division 2010: The Right Force Structure for the Twenty-First Century” (Master’s Thesis, US Army Command and General Staff College, 2000), 1.

¹¹ *The Military Balance 2015* (London: Europa Publications, 2015), 41.

¹² This monograph focuses on the force structure of the 82nd Airborne Division and although acknowledging the other two independent airborne brigades, the nuances of their planning are not specifically addressed.

¹³ Michelle McBride, “173rd Airborne Brigade and Texas National Guard Patching Ceremony” (November 28, 2016), accessed December 5, 2016, https://www.army.mil/article/173569/173rd_airborne_brigade_and_texas_national_guard_patching_ceremony.

to deploy a battalion, the US Army maintains a deployable force of one brigade and two battalions of airborne entry capability at a given time.¹⁴

Lastly, airborne forces are the only option to enter an area outside of the littorals forcibly. However, the Army and Marine Corps dramatically differ in their views on joint forcible entry mission. Joint forcible entry is a core competency for the Marine Corps and receives a budget for training and equipping commensurate to the importance of the mission within the service.¹⁵ The Marines sustain joint forcible entry equal to the Army's retention of its capacity to provide the military with combined arms maneuver and wide area security, which are the Army core competencies.¹⁶ The Army views its airborne capability in conducting joint forcible entry as a mission essential task rather than a core competency.¹⁷ Despite this viewpoint, in crises without maritime access, the entry operation requires airborne forces.¹⁸

Methods of Airborne Employment

Notably, the airborne forces are the least lethal combat formation in the US military arsenal. Their utility lies in their ability to seize a foothold for follow-on forces of superior combat power. The selection of an employment method depends on the capabilities of the threat. A contested entry necessitates an airdropped force, where a permissive entry lends itself to airlanding the force. Additionally, the airdropped force's objective of securing the airhead allows

¹⁴ DeVore. *When Failure Thrives*, 73.

¹⁵ US Department of the Navy, *USMC Vision 2025*, accessed January 15, 2017, http://www.onr.navy.mil/~media/Files/About-ONR/usmc_vision_strategy_2025_0809.ashx. The US Marine Corps doctrine on core competencies; USMC maintains six total core competencies. Forcible entry is number four.

¹⁶ Army Doctrine Publication (ADP) 1, *The Army* (Washington, DC: Government Printing Office, 2012), 3-3.

¹⁷ Kyle Lear, *Airborne Joint Forcible Entry: Ensuring Options for U.S. Global Response* (Strategy Research Project: US Army War College, 2012), 24.

¹⁸ Joint Publication (JP) 3-18, *Joint Forcible Entry Operations* (Joint Chiefs of Staff Printing Office, 2012), 94.

the rest of the airborne force to airland. The operational planning for Haiti had three distinct OPLANS; two plans called for the force to be both airdropped and airlanded, the third plan used only airlanded forces. This mix of entry methods is a common practice historically. Operations in Congo, Grenada, Panama, and Iraq utilized both airdropped and airlanded forces. The Dominican Republic and Haiti are the only post-World War II operations utilizing solely airlanded forces. Both methods of entry have advantages and disadvantages and in many cases must work in concert.

Airdrop

Airdropping a force is most applicable where few or no enemy anti-access and area denial systems threaten the force. History demonstrates that an airdropped force can achieve success when facing an opposing enemy force where the enemy maintains limited anti-aircraft weapons. However, that airdropped force can accomplish only limited objectives. Congo exemplifies a situation where planners assumed the airdropped force could obtain objectives beyond their operational reach, leading to mission failure. They could hold the airhead but could not secure the subsequent objectives of securing the town without substantial reinforcing entry forces.¹⁹ Airdropping the initial entry force is a last resort employment method. The airdrop method of employing an airborne force suffers from significant risk due to non-combat injuries and anti-aircraft fire. Finally, the airdropped force has limited operational reach and employs inadequate firepower to counter many enemy ground threats, placing the mission at risk if it is the sole entry force.

The most dangerous airborne force action is paratroopers exiting an in-flight aircraft in a contested environment. However, it remains the most effective, and perhaps only, entry means to seize an airhead on opposed drop zones, allowing for additional forces to conduct follow-on actions. In the most recent airborne operations with modern equipment, the airdropped forces

¹⁹ Odom. "Dragon Operations," 14.

sustained 12% casualties on the airdrop.²⁰ Historically, average rates for airdropped Soldiers experiencing non-combat related injuries is 8.4/1,000 jumps.²¹ Table 1 details documented injury rates.

Table 1. Documented Injury Rate on Airdrop of Selected Airborne Operations

Operation	Paratroopers	Injuries	Injury Rate
Dragon Operations	320	8	2.5000%
Urgent Fury	5,000	40	0.8000%
Just Cause	3,900	71	1.8205%
Iraqi Freedom	963	18	1.8692%

Source: Author-Created Chart ²²

However, the documented injury rates for recent combat operations exceed the historical rate. Further, when the Army studied injury rates during combat operations, the self-reported injury rate was even higher. This rate was 518.5/1,000 for the 75th Ranger Regiment in Operation Just Cause and 119.9/1,000 for the 75th Ranger Regiment in Operations Iraqi and Enduring Freedom.²³ Paratroopers are injured and continue to fight in a degraded capacity, rather than seek treatment, which explains the discrepancy between the official reports and the self-reported

²⁰ Russ Kotwal, David Meyer, Kevin O'Connor, Bruce Shahbaz, Troy Johnson, Raymond Sterling, Robert Wenzel, "Army Ranger Casualty, Attrition, and Surgery Rates for Airborne Operations in Afghanistan and Iraq," *Aviation, Space, and Environmental Medicine*, 75, no. 10 (October 23, 2004): 833–40, accessed December 5, 2016. <https://www.ncbi.nlm.nih.gov/pubmed/15497362>.

²¹ Joseph Knapik, Ryan Steelman, Kyle Hoedebecke, Shawn Rankin, Kevin Klug, Keith Collier, Bruce Jones, "Injury Incidence with T-10 and T-11 Parachutes in Military Airborne Operations," *Aviation, Space, and Environmental Medicine*, 85, no. 12 (December 6, 2014): 1161, accessed December 5, 2016. <https://www.ncbi.nlm.nih.gov/pubmed/25479257>.

²² Odom, "Dragon Operations," 86. Notes eight paratroopers injured on the jump; Raines, "The Rucksack War," 532. This source shows 25 non-combat injuries in Grenada; John McBride, Marjorie Hunt, John Hannon, Stephen Hoxie and W.G. Rodkey, *Report and Medical Analyses of Personnel Injury from Operation "Just Cause"* (San Francisco: Division of Military Trauma Research, December 1991), 11; Richard Malish and John G. DeVine, "Delayed Drop Zone Evacuation: Execution of the Medical Plan for an Airborne Operation into Northern Iraq," *Military Medicine*, 171, no. 3 (March 2006), 10.7205/milmed.171.3.224.

²³ Joseph Knapik, Ryan Steelman, Kyle Hoedebecke, Shawn Rankin, Kevin Klug, Keith Collier, Bruce Jones, "Comparison of Injury Incidence Between The T-11 Advanced Tactical Parachute System and the T-10d Parachute, Fort Bragg, NC, June 2010-November 2013," *US Army Institute of Public Health* (February 2014), 11.

injuries study. Airdropping paratroopers is not a low-risk operation for those Soldiers exiting the aircraft in combat operations, even without accounting for enemy fire.

Airland

Airlanding a force is appropriate as the sole means of entry in uncontested environments. Additionally, airlanding is the primary method of delivering the reinforcing entry forces that provide firepower, protection, and mobility to the operation. Operation Uphold Democracy demonstrated the necessity of the airlanding employment method. OPLANS 2370 and 2375 integrated an airlanded force that included the division artillery, six M551 Sheridan tanks, and large logistics deliveries.²⁴ OPLAN 2380 called for the entire 10th Mountain Division inserting via helicopter in a permissive environment, which required a secure airhead.²⁵ Airlanding a force is a necessary component of any airborne operation. Airlanding is the only way to deliver heavy enablers such as vehicles, air defenses, artillery and Army aviation assets to the battle. In fact, the airdropped force exists in most cases only to secure the airhead and allow the airlanded forces employment against deeper objectives.

Airlanding is the primary method of delivering the reinforcing entry forces into the objective area. These forces do not require reception, staging, onward movement, or integration (RSO&I). The initial entry forces have limited combat power, and the reinforcing entry forces bring the firepower to bear necessary to overcome staunch enemy resistance.²⁶ To achieve operational objectives beyond securing the airhead, the reinforcing entry forces employ directly from the airlanded runway with clearly outlined objectives. In Operation Uphold Democracy, the bulk of the 82d's combat power was to be airlanded, and those forces would provide the fire

²⁴ Kretchik et al., *Invasion, Intervention, "Intervasion"*, 51.

²⁵ Kretchik et al., *Invasion, Intervention, "Intervasion"*, 57.

²⁶ Rowayne Schatz, *Airborne Forcible Entry Operations: USAF Airlift Requirements* (Master's Thesis, US Army Command and General Staff College, 1994), 59.

support and an armored reaction force to meet deeper operational objectives. Also, the entire 10th Mountain Division would serve as the reinforcing entry forces by helicopter and would seize objectives far beyond the reach of the initial entry forces.²⁷ Expanding the lodgment is often not possible without reinforcing entry forces. Dragon Operations in the Congo illustrates planning for an airdrop of the initial entry force which failed upon execution when the operational reach of the initial entry force was only three kilometers when they encountered lightly armed resistance.²⁸ Airlanded reinforcing entry forces supply necessary combat to overcome even minor enemy resistance that can blunt the airdropped initial entry force. Without the ability to airland the initial force, there are two mitigation measures available to overcome the risk. First, the operation can dictate a task organization of a vastly overwhelming force. Otherwise, the operation must have sufficient combat power staged at the intermediate staging base for the reinforcing entry force.

Coercion or Surprise

An often-overlooked component of airborne forces is the capability as a coercion force. The airborne's ability to rapidly deploy supports the US with a coercion force that can move quickly and pressure an enemy to capitulate. Coercion is a capability the airborne contributes that allows the US to avoid conflict altogether. Joint doctrine states that an objective of joint forcible entry operations is to defeat and deter aggression.²⁹ The capability used in coercion must be credible, and credibility requires a current trained and ready force, able to execute the threatened combat operation. If the capability no longer exists, it is no longer a viable coercion. Dr. Joseph Nye, an international relations expert, discusses the concept of coercive diplomacy. He articulates how American Presidents have used military deployments or capability demonstrations as using

²⁷ Kretchik et al., *Invasion, Intervention, "Intervention"*, 51, 166.

²⁸ Odom. "Dragon Operations," 71, 92-104.

²⁹ Joint Publication 3-18, *Joint Forcible Entry Operations* (Joint Chiefs of Staff Printing Office, 2012), I-2.

“force without war.” In fact, the US has used deployments as deterrence 215 times in the last fifty years with the Navy alone. Airborne forces provide this same level of coercion for countries with no maritime access.³⁰

The entire Marine Corps exists to conduct amphibious entry operations, which are both a deterrent and a capability. The airborne forcible entry operation’s resourcing and training emphasis within the Army have declined. The military does not maintain airborne forces in the same manner as the Marines maintain amphibious coercion. An untrained and under-resourced airborne joint entry capability limits the effectiveness of using an airborne assault as a coercive deterrent. Weakness in the airborne formation allows the enemy to orient defenses effectively or disregard the threat altogether. An excerpt from the book *Bombing to Win*, articulates this coercive element: “the more important question is usually whether the coercer can inflict sufficient damage to compel concessions. Extremely high credibility that the coercer can impose damage is normally a minimum requirement.”³¹ The enemy must have sufficient respect for the combat effectiveness of US Army Airborne joint forcible entry capability for it to be an effective coercion.

Three scenarios highlighted the various degrees of the coercive effect when the US used airborne forces. The 1994 Haitian intervention demonstrated the effectiveness of coercion of the airborne formations. A deliberate broadcast of an impending US Army air assault forced the illegitimate coup leaders into negotiations, thereby avoiding a fully opposed intervention.³² Publicizing of the deployment and forward positioning of airborne forces during Operation Power Pack in the Dominican Republic was an attempt to end hostilities without combat operations. The

³⁰ Joseph Nye, *The Future of Power* (New York: PublicAffairs, 2010), 45.

³¹ Robert Pape, *Bombing to Win* (Ithaca, NY: Cornell University Press, 1996), 17.

³² Kretchik et al., *Invasion, Intervention, "Intervasion"*, 164-165.

coercive effect in this operation was limited but effective in avoiding an airdrop of paratroopers.³³ In the Congo operations in 1956, however, the publicity of airborne force positioning had no discernable effect on the enemy (rebel hostage-takers) and only served to announce the impending invasion to the enemy.³⁴ In these examples, the airborne force had the capability to execute the operation as publicized to the enemy. The coercive effect varied. However, coercion comes with a price: the loss of surprise.

Joint forcible entry operations have two competing interests: coercion and surprise. To use airborne operations as a coercion force during a conflict lets the enemy know of the US military's intention to act and allows the enemy to prepare its defenses. Preparations, such as a concerted effort at achieving local air superiority, sacrifices surprise. Gaining and maintaining the air superiority or supremacy required for a successful joint forcible entry takes weeks to achieve. Shaping operations in Libya during Operation Odyssey Dawn (2011) exposed how long the Air Force needs to establish air superiority.³⁵ Deploying the airborne entry force to a staging base jeopardizes operational surprise. Similarly, enroute stops let an enemy know of impending invasion. Operation Urgent Fury evidenced the necessity of surprise for combat operations to protect six hundred US medical students on the island of Grenada after a violent Stalinist-type coup. The US State Department notified Cuban President Fidel Castro of the operation the night before its execution. Castro ordered his forces to oppose the entry force and undoubtedly cost American Soldiers their lives during execution.³⁶ The initial entry force is incredibly vulnerable

³³ Yates, "Power Pack," 69.

³⁴ Odom. "Dragon Operations," 74.

³⁵ BBC, "Libya Crisis: Gaddafi's Air Force 'Unable to Fight'," *BBC Africa* (March 23, 2011), accessed November 17, 2016. <http://www.bbc.com/news/world-africa-12837330>.

³⁶ David Rivard, *An Analysis of Operation Urgent Fury* (Maxwell AFB, AL: Air Command and Staff College, 1985), 12.

to counterattack. Surprise is the element enabling the force to achieve its operational objectives. Sacrificing surprise in favor of coercion allows the enemy to array defenses of sufficient strength to defeat initial airdropped forces. The initial entry force is simply too weak and lacks the firepower and critical enablers to defeat an organized enemy actively opposing it. Conclusively, without surprise, the operation relies on close air support aircraft, indirect fires and mobility and even with these capabilities, operational reach is limited.

Section Two: Air Force Planning Considerations

Air Force Requirements

Utilizing airborne forces in an operation requires sizable air transportation. A planner building an Air Force delivery plan must account for the lift of all critical classes of supply and enablers which constitute a greater aircraft requirement than accounting for paratroopers alone. Delivery of an airborne force to the drop zone is necessary before any other need of the airborne entry force becomes salient. This delivery requires both USAF lift assets and qualified Air Force and Army personnel to facilitate the airdrop. In the best case, the US faces an opponent that is amenable to coercion and in the range of an intermediate staging base. Potentially, the US encounters an opponent historically unswayed by coercion, necessitating surprise by the entry forces.³⁷ The limited availability of intermediate staging bases in some regions in proximity to the objective may remove airborne entry forces from operational planning.³⁸ Often, the airborne entry force must have the ability to launch directly from the US, as described in FM 3-99, to be

³⁷ This assessment is based on Iran. Iranian actions in Yemen, Iraq and the hostage crisis of the 1980's demonstrate their inability to be swayed by coercion; Sam LaGrone, "USS mason fired 3 missiles to defend from Yemen cruise missiles attack," News & Analysis (October 11, 2016), accessed December 6, 2016, <https://news.usni.org/2016/10/11/uss-mason-fired-3-missiles-to-defend-from-yemen-cruise-missiles-attack>; History.com, "Iran Hostage Crisis - Facts & Summary," history.com (2010), accessed December 6, 2016, <http://www.history.com/topics/iran-hostage-crisis>; Michael R. Gordon, "Deadliest Bomb in Iraq Is Made by Iran, U.S. Says," *Middle East* (February 11, 2015), accessed December 6, 2016, <http://www.nytimes.com/2007/02/10/world/middleeast/10weapons.html>.

³⁸ Use of intermediate staging bases increases the risk of compromise; this is described in detail in the subsequent section on intermediate staging bases beginning on page 20.

successful.³⁹ However, deploying the airborne force in this manner requires the force to move in one flight of C-17s from Pope Air Force Base with air refueling operations conducted enroute.⁴⁰ The airlift assets thus become the force limiting factor. The capability currently retained in the US military is realistically only the force able to deploy against a no intermediate staging base scenario. When determining the airborne entry capability for a given operation necessitating surprise, that force size is the force able to move directly from Pope Air Force Base in one lift of C-17s. The sorties required to move a brigade-sized force in one lift far exceed current capacity. For example, with an augmented airborne force with a Stryker or LAV vehicle, the brigade requirement for C-17 sorties is 209-245. These needs exceed current capacity as discussed below. Feasibly, a battalion one lift package requires 42-60 sorties.⁴¹

The aircraft availability for a given operation requires sufficient airframes and aircrew training. The USAF currently maintains twenty-seven airdrop qualified C-17 crews.⁴² That is the limiting factor when planning an operation requiring the massing of initial entry forces only able to be airdropped on the objective. The average aircraft availability for airborne joint entry operations with more than 86 hours' notice is 104 C-17s, with a projected maximum of 126 and

³⁹ Army Field Manual (FM) 3-99, Airborne and Air Assault Operations (Washington, DC: Government Printing Office, 2015), 1-21, 2-13.

⁴⁰ Shane Tierney, Anthony Rosello, and Christopher Pernin, "Worldwide C-17 Availability to Support 82nd Airborne Operations from Fort Bragg/Pope Field" (Santa Monica, CA: RAND, 2016); Pernin, Christopher, Katharina Best, Matthew Boyer, Jeremy Eckhause, John Gordon IV, Dan Madden, Katherine Pfrommer, Anthony Rosello, Michael Schwille, Michael Shurkin, and Jonathan Wong, "Enabling the Global Response Force Access Strategies for the 82nd Airborne Division" (Santa Monica, CA: RAND, 2016). The capabilities of the aircraft are described in the RAND *Enabling the Global Response Force* source and the C-17 is the platform that is used for long range operations detailed in the *Worldwide C-17 Availability* report.

⁴¹ John Gordon, Agnes Gereben Schaefer, David A. Shlapak, Caroline Baxter, Scott Boston, Michael McGee, Todd Nichols, and Elizabeth Tencza, "Enhanced Army Airborne Forces: A New Joint Operational Capability" (Santa Monica, CA: RAND, 2014), 54.

⁴² Tierney et al, "Worldwide C-17 Availability," 2. This page notes only twenty-seven airdrop qualified crews, to facilitate long distance operations, multiple crews are required per aircraft with the airdrop qualified crew completing the airdrop leg.

minimum of 68, given the current operational readiness rates of aircraft and crew.⁴³ The best approximation of a battalion package for airdrop deployment to seize an airhead requires forty-seven C-17s.⁴⁴ This number does not account for the additional enabler teams that doctrine requires be part of the airborne operation. These teams include a Contingency Response Group, a Combat Communications Groups, an Air and Space Expeditionary Task Force-Force Module, a Special Tactics Team, 820th Security Forces Group, an Air Force Special Tactics Teams and Tactical Air Control Party, and the Maneuver Enhancement Brigade. These teams are in addition to any mission specific task organized enablers and require space onboard the lift aircraft used in the operation, straining operational lift capacity. Citing a hypothetical vehicle equipped airborne force structure, RAND concluded the following airlift requirement shown below in Table 2.⁴⁵

Table 2: Airlift Requirements for Vehicle Equipped Airborne Force

	Required C-17 Capability	Current C-17 Capability
Airborne Brigade with Stryker or LAV	152-245	68-126
Airborne Battalion with Stryker or LAV	35-60	68-126

Source: Gordon et al. “Enhanced Airborne Forces,” 34-54; Tierney et al, “Worldwide C-17 Availability,” Xii.

The last significant impact air crews have on massing relates to the training required for them to fly in large formations. Contested airborne forcible entry operations require tight formations at low-altitude on the same relative flight path to deliver the ground force in mass on the objective.⁴⁶ There is no current reference for the US airlift force training close formation flight of C-17s in the quantity called for in planning analysis, and it is likely an untrained

⁴³ Tierney et al, “Worldwide C-17 Availability,” Xii.

⁴⁴ Schatz, *Airborne Forcible Entry Operations*, 104; Gordon, “Enhanced Army Airborne Forces,” 54.

⁴⁵ Gordon et al, “Enhanced Airborne Forces,” 34-54.

⁴⁶ Schatz, *Airborne Forcible Entry Operations*, 55.

requirement for most C-17 aircrews.⁴⁷ Therefore, the effectiveness of the C-17's formation control system, MILACAS-FR (Military Aircraft Collision Avoidance System - Formation Rendezvous), to perform with sixty or more aircraft is untested.⁴⁸

Arguably, the C-17 will not be the sole airlift platform for an airborne operation. For some objectives, C-130s may augment the airlift operation. The range of a C-130 is limited in comparison with the C-17, 3,500 nautical miles for the C-17 and 2,000 nautical miles for the C-130. However, the C-130 fleet lacks the aerial refueling capability of the C-17.⁴⁹ Therefore, operational planning cannot utilize C-130 augmentation in many possible scenarios, such as a situation with an adversary more than 2,000 nautical miles from Pope Air Force Base. Figure 1 below depicts land masses in range of C-130s departing Pope Air Force Base.

⁴⁷ Guinness World Records 2016, "Largest cargo aircraft formation from a single base", December 21, 2006, accessed December 9, 2016, <http://www.guinnessworldrecords.com/world-records/largest-cargo-aircraft-formation-from-a-single-base/>. Twenty is the number documented in the Guinness Book of World Records in 2006.

⁴⁸ Honeywell International Inc. MILACAS-FR (Military Aircraft Collision Avoidance System - Formation Rendezvous) Formation Flying System, 2007.

⁴⁹ Christopher Pernin, Katharina Best, Matthew Boyer, Jeremy Eckhause, John Gordon IV, Dan Madden, Katherine Pfrommer, Anthony Rosello, Michael Schwille, Michael Shurkin, and Jonathan Wong, "Enabling the Global Response Force Access Strategies for the 82nd Airborne Division" (Santa Monica, CA: RAND, 2016), 28; Cristian Simon, "A Case Study of Jumping from the C-17 and the C-130: A Better Platform for Paratroopers" (Graduate Research Project, School of Logistics And Acquisition Management of the Air Force Institute of Technology, 2004).

Figure 1: Range of C-130's Departing Pope Air Force Base



Source: Author Created Figure with Google Earth Imagery

Anti-Access and Area Denial (A2AD) Considerations

Enemy Anti-Access Area Denial (A2AD) systems pose a significant risk to an airborne force. An airborne force is most vulnerable when on approach to its objectives while flying at less than 1,000 feet above ground level and at 130 knots. The highest risk to the aircraft while in formation is radar-guided surface-to-air missiles. Facing these systems is likely as modern employment methods have been effective in defeating US suppression of enemy air defense

operations.⁵⁰ The threat is so great that, in fact, no airborne operation has been conducted against an enemy possessing a radar guided missile threat. These systems are expensive, and currently, only twenty countries have operational systems or have imminent acquisition plans.⁵¹ The threat that is more common and more difficult to defend against is low-cost anti-aircraft artillery and infrared or optically tracked man-portable air defense systems. To date, there have been no airborne operations undertaken against man-portable air defense systems. However, several operations have endured anti-aircraft artillery fire. Table 3 shows the resulting damage inflicted against air transport aircraft.

⁵⁰ Gordon, “Enhanced Army Airborne Forces,” 18. Describing enemy tactics in Kosovo, “The challenge of suppressing air defenses should not, however, be underestimated. During Operation Allied Force in Serbia-Kosovo in 1999 the NATO air forces had great difficulty in locating the Serb air defenses, including emitting radar-guided SAMs. Clever radar management and frequent moves of SAM units on the part of the Serbs reduced the effectiveness of NATO’s suppression of enemy air defense systems operation.”

⁵¹ The Military Balance 2015, London: Europa Publications (2015); Gordon, “Enhanced Army Airborne Forces,” 1-41.

Table 3. Aircraft Damaged During Airborne Operations

<u>Operation</u>	<u>Lift Aircraft Employed</u>	<u>Number Damaged</u>	<u>Number Destroyed</u>	<u>Damage Rate</u>	<u>Destroyed Rate</u>	<u>Threat Faced</u>
Dragon Operations	5	4	0	80%	0%	Light Anti-Aircraft (.50)
Power Pack	144	0	0	0%	0%	none
Urgent Fury	26	1	0	4%	0%	Heavy Anti-Aircraft Guns
Just Cause	111	14	0	13%	0%	Heavy Anti-Aircraft Guns
Iraqi Freedom	16	1	0	6%	0%	Small Arms

Source: Author-Created Chart ⁵²

Technological advances have increased the risk to airborne entry forces. GPS jamming can affect an aircraft's drop zone control equipment and some targeting systems. The old fashioned way of finding a drop zone with ground markers may be necessary but requires an advance pathfinder element to be on the ground. Recent airborne operations in Panama and Iraq relied heavily on special operations forces providing intelligence and limited security before entry by the conventional airborne force. The requirement for special forces preceding the conventional force has become the standard model, and it is presumed to remain the way forward in planning for future operations.⁵³ However, scenarios arise where the environment is not permissive and

⁵² Odom. "Dragon Operations," 86. This page notes four of the five C-130s were hit by ground fire; Yates, "Power Pack. No aircraft were reportedly struck by ground fire; Daniel Haulman, *Crisis in Grenada: Operation Urgent Fury* (Maxwell AFB, AL, Air Force History and Museums Program Publication: Short of War, August 23, 2012), 139, accessed February 14, 2017. <http://media.defense.gov/2012/Aug/23/2001330105/-1/-1/0/urgentfury.pdf>. This source identifies one C-130 hit by ground fire; Beth Scott, James Rainey, and Andrew Hunt, *The Logistics of War: a historical perspective* (Maxwell AFB, AL: The Air Force Logistics Management Agency, August, 2000), 201, This page notes fourteen were hit by ground fire; Fontenot et al., *Operation Iraqi Freedom*, 226. This source depicts one MC-130 damaged by ground fire, and total aircraft used were 1 x MC-130 for special forces and 15 x C-17s used by 173rd totaling 16 in the airlift force.

⁵³ Fontenot et al., "Operation Iraqi Freedom," 222-230.

special operations cannot gain entry before the conventional airborne force's arrival. This lack of ground direction could cause loitering around the drop zone, as in Dragon Operations in Congo, and expose the force to ground fire.

In many cases, the presence of robust enemy anti-access and area-denial systems precludes the use of airborne forces. If the decision is made to deploy the airborne force, there is a requirement for undertaking a lengthy suppression of enemy air defense campaign (SEAD). An offset airdrop of the airborne force is another mitigation method, but it requires significant mobility built into the entry force structure.⁵⁴ When a mission uses multiple waves of the same aircraft to deliver the entry forces, robust enemy air defenses pose another risk, as damaged aircraft are unavailable for the additional sorties. RAND Corporation concludes: "Airborne forces are much more viable against a poorly armed opponent (whether state or nonstate) that has only limited air defense capability than against well-armed enemies that can threaten aircraft with a mix of high- and low-altitude air defenses."⁵⁵ This observation is poignant. The ability to use airborne forces against a technologically advanced adversary or one with terrain that conceals man-portable air defense systems or anti-aircraft artillery is infeasible and there is no current mitigation to overcome the risk involved in an operation undertaken against advanced enemy air defenses.

Intermediate Staging Bases (ISBs)

The global response force can deploy from either Pope Air Force Base or a forward positioned intermediate staging base. Utilizing an intermediate staging base affords several advantages to an airborne forcible entry operation. An intermediate staging base allows the integration of C-130s into the air transportation plan.⁵⁶ Additionally, an intermediate staging base

⁵⁴ Gordon, "Enhanced Army Airborne Forces," 24.

⁵⁵ Gordon, "Enhanced Army Airborne Forces," 24.

⁵⁶ Pernin, "Enabling the Global Response Force," 11.

allows the ground force to rest and prepare for combat operations with shorter flight times to the objective. Critically, it reduces the aircraft and qualified aircrew requirements for a given operation, as multiple turns with the same aircraft can take place from the objective to the intermediate staging base and back with minimal delays between sorties. Most models for employment of an airborne force rely on calculations generated by using intermediate staging bases. One estimate finds the needed aircraft are only twenty-five C-17s for the initial entry (airdropped) force and sixty-five for the reinforcing entry forces to deliver an entire brigade to the objective.⁵⁷

However, the reliance on intermediate staging bases is a weakness when assessing the airborne joint forcible entry capabilities. Integrating the intermediate staging base into an operational plan is not without risk and is subject to local availability. Utilizing the intermediate staging base or an en route stop also jeopardizes surprise, which is a vital characteristic of successful airborne forcible entry operations. The enemy will identify possible locations, especially if only one is available. Additionally, media attention and the US entering an agreement with a specific host nation tips of the enemy to an imminent invasion, allowing it to more efficiently prepare its defenses.⁵⁸ The most current analysis assumes the use of an intermediate staging base for operations and current US force structure rests on that assumption.⁵⁹ However, the reality of some contingencies is that intermediate staging bases are too risky to utilize; those operations mandate a direct flight from Pope Air Force Base.

The risk of catastrophic mission failure increases where the airborne operational plan relies on a limited number of aircraft. Aircraft damaged or destroyed deploying the initial entry

⁵⁷ Pernin, "Enabling the Global Response Force," 38.

⁵⁸ Schatz, *Airborne Forcible Entry Operations*, 81-82.

⁵⁹ Maintaining only twenty-seven qualified crews and analyzing the RAND Global Response Force report demonstrates this assumption noting that this is sufficient to deliver the Global Response Force

force are not available for delivery of the reinforcing entry force. This lack of aircraft increases the risk of defeat in detail of the initial entry force. Historical examples include operations in the Congo and the failed Operation Eagle Claws to rescue the US hostages in Tehran, where damaged aircraft thwarted mission success. A necessary risk mitigation measure for lost or compromised aircraft is redundant lift aircraft at the intermediate staging base. A brigade sized operation is not feasible without an intermediate staging base. When the operation does not allow for forces to stage, the only option is a direct flight from Pope Air Force Base and that operation is limited to the maximum size of a battalion task force.

Section Three: Army Planning Considerations

Focus on the Ground Tactical Plan

Aircraft availability dictates ground force size which influences achieving the mass needed for the success of the ground tactical plan. When planning an operation, the ground tactical plan should determine the aircraft request rather than aircraft availability determining the strength of the ground force. The issue of massing has been a friction point between the Army and Air Force since World War II. The planning for the unexecuted Operation Comet exhibited this problem.⁶⁰ The ground force commander wanted to achieve mass with a single, large lift in one day. Troop Carrier Command cited crew fatigue and aircraft maintenance issues and would only commit to a multi-day airdrop that delivered the force piecemeal and in insufficient strength to achieve operational success. Troop Carrier Command's capability to trump the ground force commander's request led to the cancellation of the operation.⁶¹ Opposing perspectives about massing still exist in the two services today. Overwhelming forces as seen in Operation Urgent

⁶⁰ Operation Comet was similar to Operation Market Garden only smaller in scale and was scheduled for execution in September 1944.

⁶¹ John Gwinn, "Scratched: World War II Airborne Operations That Never Happened" (Monograph, US Army Command and General Staff College, 2014), 21.

Fury may not always be available, although it remains the default operational plan. In Panama, “planners correctly saw that the risk to the overall force was lowered by achieving mass instead of piecemeal insertion that would put insufficient combat power on the objective area during the key initial minutes of the assault.”⁶² The appropriately sized force to seize key objectives at the proper time is the hallmark of successful airborne operation.

The operational effectiveness of the ground forces depends on the ability to deliver the properly sized force to meet operational demands. RAND had published a recommendation regarding the ability to mass the appropriately sized force when they studied the airborne forcible entry issue: “The key recommendation here is for the Army to implement constraint-driven planning, build force packages and flow rates appropriately, and convey risks associated with those packages for decision makers; this includes working with USAF to define a shared vision of what the Army needs and the USAF would expect to provide, so CCMDs requesting support are not surprised.”⁶³ It is not what the Army needs; it is what the mission dictates to be successful that matters. Any deficiency should be addressed well before paratroopers are executing an H-hour timeline. The Air Force must maintain and have available for operations the minimum number of qualified aircrew and aircraft sufficient to meet all objectives to be executed in a given plan. Stating that the Army needs to temper aircraft expectations and arrival times is a disconnect between the Army and Air Force that has historically documented challenges which resulted in canceled operations.⁶⁴ There are examples of missions conducted that needed massing of the initial entry force and thus, could not depend on turns of aircraft delivering the reinforcing entry force. The necessity of combat power was immediate and required 100 or more aircraft,

⁶² Schatz, *Airborne Forcible Entry Operations*, 55.

⁶³ Pernin, “Enabling the Global Response Force,” xxi, 106.

⁶⁴ Gwinn, “Scratched: World War II Airborne Operations,” 13-19.

specifically Panama, citing one example.⁶⁵ This needed quantity has not changed, and it is a capability that has evaporated from the force by way of limited qualified aircrews and limited aircraft. Any plan requiring airborne forces must have advanced planning and close workings with the Air Force to ensure operational requirements are feasible and allow for additional training of aircrews prior to execution.

Build the Team

The massing of ground forces is not the only element where mass is a planning consideration for a successful airborne joint forcible entry operation. The entire joint force must rapidly aggregate.⁶⁶ This aggregation involves bringing all elements together to plan and execute the operation. Staff must be massed to facilitate the planning before launching the operation.⁶⁷ In Operation Uphold Democracy, the planners overlooked the need to mass the interagency staff necessary to facilitate the multi-national elements which were critical to the operation.⁶⁸ The ability to achieve the proper mass necessary for operational success entails adjusting command relationships to best facilitate proper control of the joint force at defined stages.⁶⁹ Crisis response requires very quick force aggregation; however, this speedy aggregation does not negate the need for having the proper strength and size of the force. According to joint doctrine, the force tailored

⁶⁵ William Huff IV, "The United States 1989 Military Intervention in Panama: A Just Cause?" (Master's Thesis, Florida State University, 2002), 29. 111 lift aircraft used in the operation which was sufficient to achieve all operational objectives.

⁶⁶ Joint Chiefs of Staff, *Joint Concept for Rapid Aggregation* (Washington, DC: Joint Chiefs of Staff Printing Office, 2015).

⁶⁷ *Joint Concept for Rapid Aggregation*, 18.

⁶⁸ Kretchik et al., *Invasion, Intervention, "Intervasion"*, 163.

⁶⁹ *Joint Concept for Rapid Aggregation*, 15.

to be responsive may now lack the size.⁷⁰ Speed will not always replace size and strength, including that of planners and staff.

Planning Time

The amount of time allotted for planning correlates to the riskiness of an operation. The more time allowed for planning an operation, the better the situational awareness of the operating environment. An operation can employ a variety of intelligence assets given sufficient time. With limited time, staff estimates can only integrate aircraft and space-based resources. Modern airborne forcible entry scenarios call for special forces providing intelligence on airborne drop zones and objectives. The airborne insertion conducted in Operation Iraqi Freedom demonstrated the effectiveness of the Joint Special Operations Forces deploying ahead of the conventional force to provide the necessary intelligence and security.⁷¹ Otherwise, planning assumptions are confirmed or denied when forces arrive on the objective during plan execution, instead of having advance intelligence. The time allotted for six US post WWII operations is shown below in Table 4.

⁷⁰ *Joint Concept for Rapid Aggregation*, 28.

⁷¹ Fontenot et al., *Operation Iraqi Freedom*, 227.

Table 4. Planning Time Allotted for Airborne Selected Airborne Operations

<u>Operation</u>	<u>Planning Time</u>
Dragon Operations	4 days
Power Pack	4 days
Urgent Fury	4 days
Just Cause	137 days
Iraqi Freedom	23 days
Uphold Democracy	253 days

Source: Author-Created Chart ⁷²

With 253 days to plan, Operation Uphold Democracy provided time to confirm planning estimates before execution.⁷³ In contrast, limited planning time resulted in faulty, unconfirmed assumptions that detrimentally impacted execution in Dragon Operations, Operation Power Pack, and Operation Urgent Fury. In the Congo Dragon Operations, faulty planning assumptions led to the decision to deploy a force of inferior strength.⁷⁴ In Operation Power Pack, the plan hinged on assumptions that the enemy forces were tired and demoralized and airfields were in friendly hands; consequently, some Soldiers were issued no ammunition. Additionally, one of the planned drop zones was coral. Which, if utilized, would have caused many paratrooper injuries during the airdrop.⁷⁵ Operation Urgent Fury had planning time issues as well. General Vessey, the Chairman of the Joint Chiefs of Staff during the operation, stated, “We planned the operation in a very short

⁷² Odom, "Dragon Operations," 174. USEUCOM start date was 10 November and order published 14 November; Yates, "Power Pack." 26 April to 29 April; Ronald Cole, *Operation Urgent Fury: The Planning and Execution of Joint Operations in Grenada, 12 October-2 November 1983* (Washington, DC: Joint History Office, Office of the Chairman of the Joint Chiefs of Staff, 1997). 21 October to 24 October; Cole, "Operation Just Cause", 13. 4 August 82nd Notified via meeting with Gen Thurman to begin planning and 19 December Execution; Carol Migdalovitz, *Iraq: Turkey, the Deployment of U.S. Forces, and Related Issues*. 2003, accessed November 18, 2016. <http://congressionalresearch.com/RL31794/document.php>. 1 March Turkey denied use of land to land forces, 23 March execution of airborne operation; Kretchik et al., *Invasion, Intervention, "Intervasion"*, 45, 214. 8 January start time and the order published 18 September.

⁷³ Kretchik et al., *Invasion, Intervention, "Intervasion"*.

⁷⁴ Odom. "Dragon Operations," 52.

⁷⁵ Yates, "Power Pack," 69-70.

period of time--in about 48 hours. We planned it with insufficient intelligence for the type of operation we wanted to conduct. As a result, we probably used more force than we needed to do the job, but the operation went reasonably well.”⁷⁶ In contrast to the operations planned with minimal time, in Operation Just Cause, special forces had ample time to relay immediate intelligence to planners.⁷⁷ Additionally, with more planning time, both Air Force and Army personnel conducting the Panama operation held a rehearsal before the airdrop. Combat leaders noted the increased confidence of the joint entry force upon execution.⁷⁸ Insufficient planning time results in imperfect information and faulty assumptions.

A longer planning time permits significant changes to the operations orders. Operation Uphold Democracy affirmed the necessity for longer planning times as the plan went through three significant evolutions.⁷⁹ The inability of planners to adjust the order for Operation Power Pack forced implementation of changes during execution. The airborne entry force had to reconfigure from airdrop to airland mid-flight. This enroute change created chaos during the execution of the operation. This chaos was avoidable had the intelligence picture had time to develop and been integrated into the plan.⁸⁰ Allowing intelligence to drive operational planning takes time that historically has not always been available during crisis intervention.

The less time allotted for planning, the more the operation hinges on rushed preparation. Soldiers in Operation Power Pack did not receive a brief before executing operations. This oversight resulted in a ground situation where Soldiers did not know where they were; who was civilian, ally, or enemy; or the intent of the operation.⁸¹ Resourcing those paratroopers was

⁷⁶ Cole, “Operation Urgent Fury,” 65.

⁷⁷ Yates, “The U.S. Military Intervention in Panama,” 47.

⁷⁸ Schatz, *Airborne Forcible Entry Operations*, 55-56.

⁷⁹ Kretchik et al., *Invasion, Intervention, "Intervasion"*, 78.

⁸⁰ Yates, “Power Pack,” 62-69.

⁸¹ Yates, “Power Pack,” 64.

difficult as well. Again, with the short planning time allowed in Operation Power Pack, entry forces had no updated maps and ammunition was scarce for some units. The operation also suffered from the lack of Spanish-speaking intelligence officers, because of inadequate time to requisition them from the Army resource pool.⁸² The same critical failures would have occurred in Grenada but for the overwhelming force.⁸³ Minimizing chaos during execution of the operation requires Soldiers having information about the enemy and terrain and being equipped to meet the likely challenges.

The history of planning airborne entry operations shows that compartmentalizing the planning effort degrades the operational effectiveness of the entry force. *The Joint Concept for Rapid Aggregation* notes, “To maximize individual contributions, external staff augmented will require timely access to shared information.”⁸⁴ Sharing information is not possible where the planning effort is compartmentalized and “need-to-know.” Operation Uphold Democracy suffered from a lack of shared planning because of compartmentalization. Compartmentalization excluded officers critical to the planning process and cross-talk between headquarters and adjacent units was impossible.⁸⁵ Due to security concerns, operational planning for Urgent Fury suffered from severely restricted access resulting in intelligence, deployment organizations, and combat support agencies being excluded or unaware of a plan being undertaken and ultimately had no contribution to the planning process.⁸⁶ Effective plans require intelligence updates and staff estimates from experts in specialized fields. Additionally, FM 3-99 notes that airborne

⁸² Yates, "Power Pack," 66, 88.

⁸³ Cole, "Operation Urgent Fury," 66, 93.

⁸⁴ *Joint Concept for Rapid Aggregation*, 18.

⁸⁵ Kretchik et al., *Invasion, Intervention, "Intervasion"*, 46-47.

⁸⁶ Cole, "Operation Urgent Fury," 66.

operations require exchanging of liaisons, which is not possible in a rushed planning effort.⁸⁷ With insufficient planning time and compartmentalization of the planning effort, exchanging liaisons or even information sharing is nearly impossible.

Longer planning time allows the formation of an effective joint force. A longer planning time allows integration of critical capabilities and enablers into the operation. Without significant time allowed for planning, those key enablers will have limited effectiveness as they do not have access to planning assumptions and updated intelligence.⁸⁸ Coordination with multi-national coalition partners is necessary, as current Army Chief of Staff, General Milley, states, “we (the US) will not fight alone and never have.”⁸⁹ This coordination applies to the international airborne forces as well, showcased in the execution of the training exercise, Operation Swift Response.⁹⁰ Coordination with local forces, interagency, and multi-national forces takes time. For a joint force to be effective, the planning timeline must include coordination time. Operations in the Congo give historical context. The USAF conducted a reconnaissance operation to collect imagery of the objectives in the Dragon Operations. However, coordination with the Belgian Paratroopers executing the ground operation never took place.⁹¹ With the premise of never fighting alone, additional planning time is necessary to fully integrate multi-national and joint partners into future successful airborne operations.

The increased risk of operational security breaches is a significant drawback to allotting a longer planning time. During the planning for Operation Uphold Democracy, the final assessment

⁸⁷ Army Field Manual (FM) 3-99, *Airborne and Air Assault Operations* (Washington, DC: Government Printing Office, 2015), 1-20.

⁸⁸ *Joint Concept for Rapid Aggregation*, 22.

⁸⁹ David Vergun, "Milley Dispels 4 Seductive Myths of Warfare" (October 18, 2016), accessed December 5, 2016. <https://www.army.mil/article/157020>.

⁹⁰ U.S. Army in Europe (May 19, 2016), accessed January 17, 2017, <http://www.eur.army.mil/swiftrresponse/>.

⁹¹ Odom. "Dragon Operations," 73.

notes that operational security was nearly impossible to maintain. However, no security breach occurred during the compartmentalized planning effort. Within a matter of days, after briefing the plan to interagency partners, Operation Uphold Democracy was in the media, complete with operational sketches and objectives.⁹² The phenomenon of news agency leaks has increased with time. CNN and other news agencies monitor Pope Air Force Base in times of crisis.⁹³ A modern problem is social media, as it jeopardizes operational security instantaneously. One Soldier posting a message to friends can go viral in seconds. Thus, the reporting by the media and social networking sites can necessitate a rapid response by entry forces at the expense of planning time. The balance between rapid deployment and planning time is a risk consideration determined by commanders. Ultimately, without more than 100 days allotted for planning, the only historically observed mitigation measure is to assemble a vastly overwhelming force as demonstrated in Grenada.

Critical Requirements Necessary to Support Ground Forces

Several capability enhancements are critical to effectively employing airborne formations. Specifically, the airborne units need reconnaissance, fire support, protection, lethality, sustainment, communication, and mobility enhancement. Without addressing these critical areas an organic airborne force lacks, the operation is likely to fail.

A successful airborne joint forcible entry operation requires effective reconnaissance. Doctrine calls for early reconnaissance of the objective.⁹⁴ This reconnaissance can take place electronically, but local human reconnaissance of the objective is superior. During Operation Just Cause, joint special operations command secured critical sites and provided local reconnaissance

⁹² Kretchik et al., *Invasion, Intervention, "Intervasion"*, 71.

⁹³ Schatz, *Airborne Forcible Entry Operations*, 81.

⁹⁴ Joint Publication 3-18, *Joint Forcible Entry Operations* (Joint Chiefs of Staff Printing Office, 2012), IV-3.

of the objective areas.⁹⁵ During Operation Iraqi Freedom, special forces secured the landing zones and relayed to conventional forces critical intelligence of the drop zone.⁹⁶ However, some countries have advanced denial systems that do not allow special operations forces to enter the objective area to provide this reconnaissance. Additionally, denying the special operations forces elements from preceding the airborne operation increases the risk to the aircraft by leaving them susceptible to shoulder-fired surface-to-air missile systems. Without military ground forces positioned in advance of the airdrop, those systems can effectively deny the area to airborne assault forces. The early conditions setting by special operations forces as outlined by doctrine emphasizes that airborne joint forcible entry is not feasible without special operations forces. There currently is no substitute for special operations forces capability to provide reconnaissance and interdiction before the airborne assault. In areas that deny special operations forces insertion, airborne assault is too risky and is not viable. In fact, the only mitigation measure available to a planner to create a feasible operation without special forces ground reconnaissance is to plan an operation that assembles an airborne force of such strength that the operation cannot fail even if all planning assumptions are proven false.

If airdrop is the selected operational entry method, a successful plan requires the joint force to communicate during the conduct of the airdrop. These joint communications systems and procedures require proper planning and resourcing. It is a well-known issue within the Army jumpmaster community of the inability for ground leaders to talk to the individual aircraft conducting the airdrop operation.⁹⁷ This lack of communication creates problems with personnel accountability as ground combat leaders do not have real-time access to aircraft to identify any

⁹⁵ Jennifer Taw, "Operation Just Cause: Lessons for Operations Other Than War" (Santa Monica, CA: RAND, 1996), 15.

⁹⁶ Fontenot et al., *Operation Iraqi Freedom*, 227.

⁹⁷ This issue was discussed by the author at US Army Jumpmaster School and is an ongoing conversation by the author with several US Army jumpmasters in the period of 2009 to present.

Soldier(s) who failed to exit. Consequently, maintaining situational awareness is impossible for the ground leaders without communication with aircraft conducting the operation.

A further key to success in airborne entry operations requires adequate fire support. The initial entry force is dependent on joint fire support.⁹⁸ Assuming the operation takes place outside of the littorals, only Air Force close air support is available to fill the fire support role. Loiter times vary by airframe, and airframes available for the operation depend on the anti-access / area denial system used by the enemy. With robust capability, slower airframes with longer loiter times, such as the AC-130 and the A-10, are not be feasible. The joint entry force must rely on platforms such as the F-35 or F-16 which can provide coverage persistently with sortie rotations from an aerial refueling platform to the objective. Integrating Army aviation into the fire support plan requires defeating the enemy's anti-aircraft weapons in the objective area. The integration of Army aviation into the airborne force has changed recently. The AH-64 has replaced the OH-58 in active duty formations. This change increases lethality, but it comes with a cost. The increase in lethality is at the expense of set-up time and deployment resource requirements. The change from OH-58 to AH-64 increases the time it takes to put the system into operation from 30 min to 3 hours. Also, it further burdens the C-17 fleet as the C-130 cannot transport the AH-64.

Establishing the entry forces organic fire support increases the effectiveness of the entry force and is a priority upon consolidation on the drop zone. Positioning and registering the force's organic fire support is necessary for effective employment.⁹⁹ The establishment of organic fires takes time, and in the interim, joint fires are the only fire support available. The effectiveness of the organic fire support does not fill the role of joint fires, as artillery no longer employs dual

⁹⁸ Joint Publication 3-18, *Joint Forcible Entry Operations* (Joint Chiefs of Staff Printing Office, 2012), IV-5.

⁹⁹ Army Field Manual (FM) 3-22.90, *Mortars* (Washington, DC: Government Printing Office, 2007), 1-1.

purpose improved conventional munitions to counter an enemy armored threat.¹⁰⁰ Lastly, the weight of the ammunition necessary for a self-sufficient fire-support section is immense. In remote airheads, all ammo must be transported in via aircraft. All ammo requirements are mission dependent. Nevertheless, to put the ammo demand into context, a basic load of 105mm ammo for a single six-gun battery at 500 rounds per gun translates into a total need of 3,000 rounds weighing 36lbs per round equating to a total transportable weight requirement of 108,000lbs.¹⁰¹

In addition to fires, the airborne entry force requires protection from both enemy air and armor threats immediately upon departure from the aircraft. Protecting the force from air attacks requires a deliberate operational approach as well as technical capabilities.¹⁰² Countering the attacks from the air requires establishing air superiority during the operation. The continuous protection of the entry force necessitates both an operation for continued air superiority and ground-based protection assets. The Army has long recognized its role in protection from air threats. The air defense systems (Stingers) are always the first two jumpers to exit the aircraft.¹⁰³ However, the Army has divested itself from these short-range air defense assets and currently only maintains one company. This company, Echo Company 3/4 Air Defense Artillery Battalion, only supports the 82d airborne, so utilizing the airborne brigades of the 4/25th or 173rd requires augmentation by this same company.¹⁰⁴ More robust protection assets are needed. The joint

¹⁰⁰ Mike Jacobson, "Cluster munitions no more: What this means for the U.S. Military" (September 10, 2014), accessed December 5, 2016. http://www.benning.army.mil/armor/earmor/content/issues/2014/OCT_DEC/Jacobson.html.

¹⁰¹ Kenneth Privratsky, *Logistics in the Falklands War* (Barnsley, United Kingdom: Pen & Sword Books, 2014), 128; Army Techniques Publication (ATP) 3-09.50, *The Field Artillery Cannon Battery* (Washington, DC: US Department of the Army, 2016), 1-1. The Falklands War, which utilized 105mm support, showed the 105mm basic load for a contingency operation to be 500 rounds per gun.

¹⁰² *Joint Concept for Rapid Aggregation*, 27.

¹⁰³ US Army Jumpmaster School Student Handouts and Notes, Author's Personal Library, March 2009.

¹⁰⁴ 3/4 Air Defense Artillery Battalion's Unit Webpage, accessed December 5, 2016. <http://www.bragg.army.mil/units/108ada/Pages/3-4adarhistory.aspx>.

operational access concept calls for the joint entry force to employ counter-rocket, artillery and mortar (C-RAM), and intermediate missile defense systems in the form of the expeditionary minimum engagement package.¹⁰⁵ Patriot and C-RAM require several aircraft to transport the systems to the location, further straining available lift assets.¹⁰⁶

Protecting the airborne entry force from enemy armor is a challenge. The Army no longer maintains a light tank to provide firepower to the airborne force, as utilized in Panama.¹⁰⁷ This lack of armor is an identified and unsolved capability gap since the divestment of the Sheridan light tank. The need for a light tank, such as the Sheridan, was a lesson learned in Operation Urgent Fury; “The need for a capability to conduct paratroop operations was validated again. In an age where airdrop aircraft are very vulnerable to sophisticated air defense systems, Grenada demonstrated there are still situations where a surprise airdrop will work. The force deployed must be light enough equipped to allow airdrop, yet have enough firepower available to withstand armor attacks.”¹⁰⁸ RAND proposed integrating the Light Armored Vehicle 25MM (LAV-25) into Army airborne formations to provide the firepower necessary to counter enemy armored threats. The LAV-25 is available in current Department of Defense inventories as it is fielded by the Marines. Additionally, it is a practical vehicle; it fits into C-130s, thereby allowing delivery to the

¹⁰⁵ Terrence K. Kelly et al., *Technical Report: Employing Land-Based Anti-Ship Missiles in the Western Pacific* (2013). The total package is defined with aircraft requirements by RAND, “Patriot’s minimum engagement package—which consists of two launchers, each with four missile canisters, eight total resupply missile canisters, radar and C2 systems, and all the personnel and equipment needed to fully operate the system—could be delivered with the use of five C-5s or seven C-17s.”

¹⁰⁶ Michael Tucker and Robert Lyons, “Silent Watch: The Role of Army Air and Missile Defense” (April 1, 2014), accessed December 5, 2016. <http://ndupress.ndu.edu/Media/News/News-Article-View/article/577510/jfq-73-silent-watch-the-role-of-army-air-and-missile-defense/>; Pernin, “Enabling the Global Response Force,” 105; *Joint Concept for Rapid Aggregation*, 12.

¹⁰⁷ *United States Southern Command Public Affairs After Action Report: Operation Just Cause* (1990). This after-action report discusses the utility of the Sheridan AR/AAV (Armored Reconnaissance/Airborne Assault Vehicle) in combat. The vehicle was divested and currently there is no light, mobile and protected firepower provided to airborne forces.

¹⁰⁸ Cole, “Operation Urgent Fury,” 24.

airhead without increasing the demand for C-17s. In the meantime, the joint entry force is reliant on joint fires to provide this capability. In fact, the lack of firepower has forced planners to change the task organization of a joint entry force. The lack of firepower forced decision makers to include Marines (with their aircraft and tanks) into the plan to invade Haiti in 1994.¹⁰⁹ There is clearly a gap in firepower demands between the capabilities of the airborne force and their current force structure. No matter what vehicle is selected to fill the void, it increases the logistics and transportation requirements of deploying an airborne force. Currently, the enemy's possession of an armored capability makes an airborne operation infeasible in all cases unless the operation dictates air supremacy with persistent close air support aircraft.

The armor protection provides mobility for some Soldiers executing the operation. However, the airborne joint entry force requires mobility for all Soldiers to reach distant objectives and fully secure the lodgment. The lack of mobility in Congo caused mission failure.¹¹⁰ Vehicles and fuel are the only way to achieve the needed operational reach of an entry force. Key specialty elements of the combat formation require mobility to fill their combat roles. The reconnaissance squadron requires vehicles which are organized to arrive later or with heavy airdrop sorties. The vehicular need by enablers requires more lift assets, which are limited. However, with the reconnaissance squadron being task organized as two mounted and one dismounted troop, 2/3 of the squadron's combat power is unavailable during the initial operation as the vehicles are part of a heavy airdrop or airland phase of the operation.¹¹¹ Weapons companies, which provide direct fire against personnel, vehicles, armored or other hard targets to support maneuver of infantry, face the same issue with arrival times of critical systems and

¹⁰⁹ Kretchik et al., *Invasion, Intervention, "Intervention"*, 61.

¹¹⁰ Odom. "Dragon Operations," 55-145.

¹¹¹ Mike Moobs, "The Use of the Reconnaissance Squadron during Joint Forcible Entry" *Military Review*, 96, no. 2 (May 2015): 94.

vehicles.¹¹² Mobility on the battlefield is essential in providing the response time to prevent the initial entry force from being over-run and allowing the unit's heavy weapons to be employed. These requirements mandate training and readiness exercises. The joint publication on rapid aggregation dictates a change in training rotations to focus on rapid aggregation and assembling the proper force at the proper time, a recommendation echoed by the RAND study.¹¹³

The airborne entry force must deploy with sufficient sustainment to maintain the required tempo and provide the services required by a modern US force. Every combat system discussed requires sustainment assets to remain in the fight. Specifically, the airborne entry force requires the necessary logistics to maintain combat operations: food, water, ammo, and fuel. Current doctrine breaks sustainment into three phases: assault, follow-on, and rear echelons.¹¹⁴ These echelons roughly coincide with the construct of entry forces: initial entry force, reinforcing entry forces, and follow-on forces. The logistics demands of an entry force are significant. In Operation Uphold Democracy, the planners calculated a need of 33,600 gallons of gasoline, 600,000 gallons of diesel, and 2,402,000 gallons of aviation fuel on D-day, providing the needed 30-day operational supply.¹¹⁵ These supply quantities account for all forces (Army and Marine) operating in Haiti and enumerate the demand for logistics that any global response mission requires, even one as limited as Operation Uphold Democracy. Logistics is always the limiting factor. In the yearlong planning for Operation Iraqi Freedom, the operation could not provide better logistical support than going 30-60 days without repair parts and 60-90 days without hot meals and

¹¹² Army Field Manual (FM) 3-21.12, *The Infantry Weapons Company* (Washington, DC: Government Printing Office, 2008), 1-3.

¹¹³ Pernin, "Enabling the Global Response Force," 105; *Joint Concept for Rapid Aggregation*.

¹¹⁴ Joint Publication 3-18, *Joint Forcible Entry Operations* (Joint Chiefs of Staff Printing Office, 2012), B-5.

¹¹⁵ Kretchik et al., *Invasion, Intervention, "Intervention"*, 55.

showers.¹¹⁶ Proper logistical planning allows the force to maintain the necessary tempo to achieve operational success.

Lastly, it is vital for the morale of the airborne Soldier that proper medical logistical support is provided to all echelons of the entry force. Operation Uphold Democracy integrated surgical teams into the first wave of initial entry forces.¹¹⁷ Pulling medical support and integrating them into combat formations with no prior training or coordination created problems in Operation Urgent Fury.¹¹⁸ During Dragon Operations in Congo, the medical plan was woefully inadequate and caused confusion with aircrew and ground units as they had to coordinate medical support on the spot without a cohesive plan for proper personnel and had insufficient medevac platforms for the injured.¹¹⁹ The lack of available medical support caused crises during the execution phase of the Dragon Operations, to the peril of mission accomplishment. Overcoming planning shortfalls is limited after the airborne force departs the staging base.

Conclusions and Recommendations

As demonstrated through the RAND research and case studies, airborne operations are vital to US military operations. There is no substitute for the responsiveness and capability airborne provides to strategic decision makers. Thorough planning drives effective airborne operations. The planning effort for an airborne operation must account for joint, Air Force, and Army planning considerations. Table 5 below summarizes the risks and mitigation measures associated with planning an airborne operation.

¹¹⁶ Charles Fletcher Jr., "Is the Army Ready for Expeditionary Operations?" *Army Sustainment Magazine*, 48, no. 3 (May 2016): 34, accessed August 27, 2016. <http://www.army.mil/armysustainment>.

¹¹⁷ Kretchik et al., *Invasion, Intervention, "Intervasion"*, 55.

¹¹⁸ Raines, "The Rucksack War," 397.

¹¹⁹ Odom. "Dragon Operations," 108-129

Table 5: Summary Risk / Mitigation Matrix for Airborne Operations

Can Airlift on Initial Entry	Operation Has Surprise	Enemy Advanced A2AD	Enemy Staging Base	In Range of an Intermediate Operation	Special Forces Ground Recon Preceding Operation	Planning Time 100+ Days	Enemy Armor Threat	Risk	Mitigation
Y	Y	N	Y	Y	Y	Y	N	Ideal For Airborne Operations	
Irrelevant	Irrelevant	Y	Irrelevant	Irrelevant	Irrelevant	Irrelevant	Irrelevant	Infeasible	
Y	Y	N	Irrelevant	Y	Irrelevant	Irrelevant	Y	High Risk	Must have air supremacy and constant close air-support
Y	Y	N	Irrelevant	N	Irrelevant	Irrelevant	Y	Infeasible	
Y	N	N	Irrelevant	Y	Irrelevant	Irrelevant	Y	Infeasible	
N	Y	N	Irrelevant	Y	Irrelevant	Irrelevant	Y	Infeasible	
N	Y	N	Irrelevant	N	Irrelevant	Irrelevant	Y	Infeasible	
Irrelevant	Y	N	Irrelevant	N	Irrelevant	Irrelevant	N	High Risk	Must have overwhelming force
Irrelevant	N	N	Irrelevant	N	Irrelevant	Irrelevant	N	Infeasible	
N	N	N	N	Y	N	N	N	High Risk	Must have overwhelming force
N	N	N	N	Y	Y	Y	N	Infeasible	
Y	N	N	N	Y	Y	Y	N	High Risk	Limited to Battalion direct flight from Pope AFB
N	Y	N	N	Y	Y	Y	N	Infeasible	
Y	Y	N	N	Y	Y	Y	N	High Risk	Limited to Battalion direct flight from Pope AFB
N	Irrelevant	N	Y	Y	Y	Y	N	High Risk	Must have sufficient combat power staged at ISB for reinforcing entry force
Y	N	N	Y	Y	Y	Y	N	High Risk	Close air-support, indirect fires and mobility are vital and operational reach is limited

Source: Author Created Chart

When a planner examines the joint doctrinal considerations, and understands the history of using airborne forces and the joint nature of these operations then two decisions become clear: does the force airdrop or airlift and does the force serve as an element of coercion or is surprise utilized in the operation. The joint force is delivered either via airdropping or airlifting. Airdropping a force is the riskiest and places the greatest burden on airlift assets. Recent airdropping operations have witnessed injury rates as high as 51.8%. Airlifting allows the joint

entry force to deliver all necessary enablers to facilitate operational reach and survivability. The second joint consideration is the binary decision of using airborne forces to coerce or to employ the formation with complete surprise. Coercion has been shown to have varying amounts of effect on enemy forces. However, using airborne forces as a coercion force, absolutely eliminates their ability to achieve surprise when executing operations. Sacrificing surprise results in limited operational reach and close air-support, indirect fires and mobility are vital to even limited success. These two decisions – the method of employment and whether to employ airborne formations in an effort to coerce the enemy or with surprise during operational execution - are the foundational principles whose proper evaluation enable mission success.

Evaluating the Air Force planning considerations is the second distinct set of planning considerations used by a planner when building an effective airborne operation. There are three factors involved when addressing the Air Force planning considerations. The first, and arguably the most critical is the air transport needs of the airborne force. The Air Force has limited number of aircraft and is even more limited by the number of aircrews available to deliver the airborne formation to the objective area. The aircraft requirements for airborne operations have grown over the decades, it now requires 209-245 C-17s to deploy a brigade and 42-60 C-17s to deploy a battalion. Compounding the problem, the C-130 is nearly useless in modern deployments except in a small set of contingencies. Additionally, anti-access and area denial (A2AD) capabilities of the enemy must be examined and assessed. If the enemy maintains any advanced anti-access or area-denial (A2AD) systems, an airborne operation is infeasible. The local availability of intermediate staging bases (ISBs) is the third factor. Intermediate staging bases have become an integral part of planning future operations and the necessary force structure to meet service-related obligations. However, at times mission variable precludes the use of intermediate staging bases. In those cases, the military cannot perform as required by doctrine, since air transport assets can only lift one battalion of initial entry forces. This failure is due to aircraft limitations,

training deficiencies, and the lack of crew qualifications. With or without an intermediate staging base, the airborne formation must be of sufficient mass to seize and hold the assigned initial objectives. Any contemplated must analyze these factors and determine if the operation is feasible with the current Air Force capabilities.

The Army planning considerations is the third distinct set of requirements that a planner scrutinizes. The primary concern from the Army is to ensure the success of the ground tactical plan. The plan must account for the objectives of the ground tactical plan to determine the type and quantity of assets that enable that force on the objective. During all phases of the plan, the planner must build the team. The planner must account for all team members; this includes the planning team as well as members from the interagency or multi-national staff. The third and often-overlooked consideration is how much planning time is dedicated to planning the operation. Allocating more than one hundred days historically correlates to operational success as demonstrated by Operations Just Cause and Uphold Democracy as opposed to four-day planning for Operations Urgent Fury, Dragon Operations and Power Pack. The only combat-proven approach to mitigate risk from insufficient planning time is assembling an overwhelming force to significantly overmatch the opposition. Therefore, unless planning time is constrained and requires mitigation by increasing force size, then the plan must have more than 100 days allocated to planning. Considering the critical requirements necessary to support ground forces is the next step a planner must take. Brining to bear all the capabilities of the joint force provides the best opportunity for operational success. The assets that a plan must include are, reconnaissance, fire support, protection, lethality, sustainment, communication, and mobility enhancement. Failing to build these capabilities into the plan can lead to limited operational reach and the failure of an operation to meet all the mission objectives. Failing to have special forces precede the joint entry force is only mitigated by assembling a vastly overwhelming force because there is no alternative method to confirming or denying planning assumptions. Similarly, if the enemy maintains an armored threat, the mission dictates persistent close-air support aircraft and air-supremacy is

essential. Appropriate plans require including these Army planning considerations must address each planning consideration prior to execution.

Analyzing the current state of conventional airborne capabilities concludes that the US military no longer can conduct a brigade-sized airborne joint forcible entry operation in many contingencies. Proper planning of an airborne operation is more critical today, given the limited capabilities built into the force. Aggregating the proper force for the planning effort and the operation itself, requires resourcing from across the globe. Training of the joint entry force needs to be built into the plan as well as these teams have not worked together in the scale associated with modern operations, which increases the risk of the operation.

Researching the airborne capabilities and analyzing post-World War II airborne operations showcase the planning considerations in joint doctrine and in Army and Air Force requirements. RAND's two recent publications addressing both the global response force and their approach to enhancing airborne capabilities throughoutly address the issue of modernizing the airborne formation. The comprehensive case study provided by Operation Uphold Democracy in Haiti provides historical context and addresses the issues surrounding planning and deploying airborne formations in a joint forcible entry role. To supplement the scope of the historical review, five additional post-World War II operations depict the planning considerations in practice as discussed in this analysis. These operations included the Dominican Republic, Congo, Grenada, Panama and Iraq. These case studies and research publications provided a comprehensive theoretical and historical foundation. This foundation was the basis of the conclusions of this analysis arrived to in constructing an planning guide for a planner tasked with an airborne operation.

Bibliography

- 3/4 Air Defense Artillery Battalion's Unit Webpage. Accessed December 5, 2016. <http://www.bragg.army.mil/units/108ada/Pages/3-4adarhistory.aspx>.
- AeroWeb, C-17 Globemaster III. June 17, 2015. Accessed December 9, 2016. <http://www.fi-aeroweb.com/Defense/C-17-Globemaster.html>.
- Army Doctrine Publication (ADP) 3-90, *Offense and Defense*. Washington, DC: Government Printing Office, 2012.
- Army Doctrine Publication (ADP) 1, *The Army*. Washington, DC: Government Printing Office, 2012.
- Army Doctrine Reference Publication (ADRP) 5-0, *The Operations Process*. Washington, DC: Government Printing Office, 2012, 2-2.
- Army Field Manual (FM) 3-21.12, *The Infantry Weapons Company*. Washington, DC: Government Printing Office, 2008.
- Army Field Manual (FM) 3-22.90, *Mortars*. Washington, DC: Government Printing Office, 2007.
- Army Field Manual (FM) 3-99, *Airborne and Air Assault Operations*. Washington, DC: Government Printing Office, 2015.
- Army Techniques Publication (ATP) 3-09.50, *The Field Artillery Cannon Battery*, Washington, DC: Government Printing Office, 2016, 1-1.
- BBC. "Libya Crisis: Gaddafi's Air Force 'Unable to Fight'." *BBC Africa*, March 23, 2011. Accessed November 17, 2016. <http://www.bbc.com/news/world-africa-12837330>.
- Cimbala, Stephen J. *Strategy after Deterrence*. New York: Praeger, 1991.
- Cole, Ronald H. *Operation Urgent Fury: The Planning and Execution of Joint Operations in Grenada, 12 October-2 November 1983*. Washington, DC: Joint History Office, Office of the Chairman of the Joint Chiefs of Staff, 1997.
- DeVore, Marc R. *When Failure Thrives: Institutions and the Evolution of Postwar Airborne Forces*. Fort Leavenworth: Combat Studies Institute Press, 2015.
- Doscher, Thomas. "Pope Air Force Unit Lynchpin to Global Response Force Mission." February 8, 2017. Accessed February 12, 2017. <http://www.18af.amc.af.mil/News/Article-Display/Article/1076608/pope-air-force-unit-lynchpin-to-global-response-force-mission>.
- Eisenhower, Dwight D. Quotes. Accessed March 30, 2017. http://www.notable-quotes.com/e/eisenhower_dwight_d.html.
- Fletcher Jr., Charles. "Is the Army Ready for Expeditionary Operations?" *Army Sustainment*

- Magazine* 48, no. 3 (May 2016): 32–35. Accessed August 27, 2016.
<http://www.army.mil/armysustainment>.
- Flynn, Charles and Joshua Richardson. "Joint Operational Access and the Global Response Force Redefining Readiness." *Military Review*, no. 92 (July 2013).
- Fontenot, Gregory, E. J. Degen, and David Tohn. *On Point: The United States Army in Operation Iraqi Freedom*. Fort Leavenworth: Combat Studies Institute Press, 2004.
- Foreman, Amanda. "Why ‘Chesty’ Still Inspires the Marines." July 29, 2013. Accessed February 12, 2017.
<https://www.wsj.com/articles/SB10001424127887323829104578621960164422882>.
- Gordon, John, Agnes Gereben Schaefer, David A. Shlapak, Caroline Baxter, Scott Boston, Michael McGee, Todd Nichols, and Elizabeth Tencza. *Enhanced Army Airborne Forces: A New Joint Operational Capability*. Santa Monica, CA: RAND, 2014.
- Gordon, Michael R. "Deadliest Bomb in Iraq Is Made by Iran, U.S. Says." *Middle East*. February 11, 2015. Accessed December 6, 2016.
<http://www.nytimes.com/2007/02/10/world/middleeast/10weapons.html>.
- Guinness World Records 2016. "Largest cargo aircraft formation from a single base." December 21, 2006. Accessed December 9, 2016. <http://www.guinnessworldrecords.com/world-records/largest-cargo-aircraft-formation-from-a-single-base/>.
- Gwinn, John. "Scratched: World War II Airborne Operations That Never Happened." Monograph, US Army Command and General Staff College, 2014.
- Haulman, Daniel. *Crisis in Grenada: Operation Urgent Fury*. Maxwell AFB, AL, Air Force History and Museums Program Publication: Short of War, August 23, 2012. Accessed February 14, 2017. <http://media.defense.gov/2012/Aug/23/2001330105/-1/-1/0/urgentfury.pdf>.
- Heibert, Thomas. "82nd Airborne Division 2010: The Right Force Structure for the Twenty-First Century." Master's Thesis, US Army Command and General Staff College, 2000.
- History.com. "Iran Hostage Crisis - Facts & Summary." history.com (2010). Accessed December 6, 2016. <http://www.history.com/topics/iran-hostage-crisis>.
- Honeywell International Inc. MILACAS-FR (Military Aircraft Collision Avoidance System – Formation Rendezvous) Formation Flying System. 2007.
- Huff, William. "The United States 1989 Military Intervention in Panama: A Just Cause?" Master's Thesis, Florida State University, 2002.
- Jacobson, Mike. "Cluster munitions no more: What this means for the U.S. Military." September 10, 2014. Accessed December 5, 2016.
http://www.benning.army.mil/armor/earmor/content/issues/2014/OCT_DEC/Jacobson.html.
- Jahner, Kyle. "Does the Army need airborne?" February 29, 2016. Accessed February 12, 2017.

- <https://www.armytimes.com/story/military/2016/02/29/does-army-need-airborne--patroopers-debate/80748724/>.
- Joint Chiefs of Staff, *Joint Concept for Rapid Aggregation*. Washington, DC: Joint Chiefs of Staff Printing Office, 2015.
- Joint Publication 3-18, *Joint Forcible Entry Operations*. Washington, DC: Joint Chiefs of Staff Printing Office, 2012.
- Kelly, Terrence K., Anthony Adler, Todd Nichols, and Lloyd Thrall. *Technical Report: Employing Land-Based Anti-Ship Missiles in the Western Pacific*. 2013.
- Kretchik, Walter E., Robert F. Baumann, and John T. Fishel. *Invasion, Intervention, \ "Intervasion": A Concise History of the U.S. Army in Operation Uphold Democracy*. Fort Leavenworth: US Army Command and General Staff College, 1998.
- Knapik, Joseph J, Ryan Steelman, Kyle Hoedebecke, Shawn Rankin, Kevin Klug, Keith Collier, Bruce Jones. "Injury Incidence with T-10 and T-11 Parachutes in Military Airborne Operations." *Aviation, Space, and Environmental Medicine* 85, no. 12 (December 6, 2014): 1159–69. Accessed December 5, 2016.
<https://www.ncbi.nlm.nih.gov/pubmed/25479257>.
- . "Comparison of Injury Incidence Between The T-11 Advanced Tactical Parachute System and the T-10d Parachute, Fort Bragg, North Carolina, June 2010-November 2013." US Army Institute of Public Health. (February 2014).
- Kotwal, Russ S., David Meyer, Kevin O'Connor, Bruce Shahbaz, Troy Johnson, Raymond Sterling, Robert Wenzel. "Army Ranger Casualty, Attrition, and Surgery Rates for Airborne Operations in Afghanistan and Iraq." *Aviation, Space, and Environmental Medicine* 75, no. 10 (October 23, 2004): 833–40. Accessed December 5, 2016.
<https://www.ncbi.nlm.nih.gov/pubmed/15497362>.
- Labadie, COL S. J. "Jointness for The Sake of Jointness in Operation "URGENT FURY." Naval War College, 1993. Accessed December 5, 2016.
<http://www.dtic.mil/dtic/tr/fulltext/u2/a266578.pdf>.
- LaGrone, Sam. "USS *Mason* fired 3 missiles to defend from Yemen cruise missiles attack." News & Analysis. October 11, 2016. Accessed December 6, 2016.
<https://news.usni.org/2016/10/11/uss-mason-fired-3-missiles-to-defend-from-yemen-cruise-missiles-attack>.
- Lear, Kyle. "Airborne Joint Forcible Entry: Ensuring Options for U.S. Global Response." Strategy Research Project: US Army War College, 2012.
- Malish, Richard and John G. DeVine. "Delayed Drop Zone Evacuation: Execution of the Medical Plan for an Airborne Operation into Northern Iraq." *Military Medicine* 171, no. 3 (March 2006): 224–227. 10.7205/milmed.171.3.224.
- McBride, John, Marjorie Hunt, John Hannon, Stephen Hoxie and W.G. Rodkey. *Report and Medical Analyses of Personnel Injury from Operation "Just Cause."* San Francisco: Division of Military Trauma Research, December 1991.

- McBride, Michelle. "173rd Airborne Brigade and Texas National Guard Patching Ceremony." November 28, 2016. https://www.army.mil/article/173569/173rd_airborne_brigade_and_texas_national_guard_patching_ceremony. Accessed December 5, 2016.
- Migdalovitz, Carol. "Iraq: Turkey, the Deployment of U.S. Forces, and Related Issues. 2003". Accessed November 18, 2016. <http://congressionalresearch.com/RL31794/document.php>.
- Moobs, Mike. "The Use of the Reconnaissance Squadron during Joint Forcible Entry." *Military Review* 96, no. 2, (May 2015).
- Nye, Joseph. *The Future of Power*. New York: PublicAffairs, 2010.
- Odom, Thomas P. *Dragon Operations: Hostage Rescues in the Congo, 1964-1965*. Fort Leavenworth: Combat Studies Institute, 1988.
- O'Melveny, Sean. "Army's last Kiowa scout helicopter squadron switching to Apaches." September 19, 2016. Accessed January 17, 2017. <http://www.military.com/daily-news/2016/09/19/armys-last-kiowa-scout-helicopter-squadron-switching-to-apaches.html>.
- Pape, Robert Anthony. *Bombing to Win: Air Power and Coercion in War*. Ithaca, NY: Cornell University Press, 1996.
- Pernin, Christopher, Katharina Best, Matthew Boyer, Jeremy Eckhause, John Gordon IV, Dan Madden, Katherine Pfrommer, Anthony Rosello, Michael Schwille, Michael Shurkin, and Jonathan Wong. "Enabling the Global Response Force Access Strategies for the 82nd Airborne Division." Santa Monica, CA: RAND, 2016.
- Phillips, Cody R. and John S. Brown. *Operation Just Cause: The Incursion into Panama*. Washington, DC: Center of Military History, US Army, 2004.
- Privratsky, Kenneth. *Logistics in the Falklands War*. Barnsley, United Kingdom: Pen & Sword Books, 2014.
- Raines, Edgar F. *The Rucksack War: U.S. Army Operational Logistics in Grenada, 1983*. Washington, DC: Center of Military History, US Army, 2010.
- Rivard, David. "An Analysis of Operation Urgent Fury." US Air Command and Staff College, Maxwell AFB, AL, 1985.
- Schatz, Rowayne. "Airborne Forcible Entry Operations: USAF Airlift Requirements." Master's Thesis, US Army Command and General Staff College, 1994.
- Scott, Beth, James Rainey, and Andrew Hunt. *The Logistics of War: a Historical Perspective*. Maxwell AFB, AL: The Air Force Logistics Management Agency, August, 2000.
- Simon, Cristian. "A Case Study of Jumping from the C-17 and the C-130: A Better Platform for Paratroopers." Graduate Research Project, School of Logistics And Acquisition Management of the Air Force Institute of Technology, 2004.

Taw, Jennifer. "Operation Just Cause: Lessons for Operations Other Than War." Santa Monica, CA: RAND, 1996.

The Military Balance 2015. London: Europa Publications, 2015.

Tierney, Shane, Anthony Rosello, and Christopher Pemin. "Worldwide C-17 Availability to Support 82nd Airborne Operations from Fort Bragg/Pope Field." Santa Monica, CA: RAND, 2016.

Tucker, Michael and Robert Lyons. "Silent Watch: The Role of Army Air and Missile Defense." April 1, 2014. Accessed December 5, 2016. <http://ndupress.ndu.edu/Media/News/News-Article-View/article/577510/jfq-73-silent-watch-the-role-of-army-air-and-missile-defense/>.

"U.S. Army in Europe". May 19, 2016. Accessed January 17, 2017. <http://www.eur.army.mil/swiftresponse/>.

United States Southern Command Public Affairs After Action Report: Operation Just Cause. 1990.

United States Department of the Army Pamphlet, No 20-232, *Airborne Operations: A German Appraisal*. Washington, DC: Government Printing Office, 1951.

United States Department of the Navy, *USMC Vision 2025*, Accessed Jan 15, 2015. <http://www.hqmc.marines.mil/Portals/142/Docs/MCVS2025%2030%20June%5B1%5D.pdf>

United States Army Jumpmaster School Student Handouts and Notes, Author's Personal Library, March 2009.

United States Army Maneuver Center of Excellence. *The Airborne Creed*. Accessed April 10, 2017. <http://www.benning.army.mil/infantry/RTB/1-507th/airborne/content/pdf/Airborne%20Creed.pdf>.

Vergun, David. "Milley Dispels 4 Seductive Myths of Warfare." October 18, 2016. Accessed December 5, 2016. <https://www.army.mil/article/157020>.

Yates, Lawrence A. *Power Pack: US Intervention in the Dominican Republic, 1965-1966*. Fort Leavenworth: Combat Studies Institute, 1988.

———. *The U.S. Military Intervention in Panama Origins, Planning, and Crisis Management June 1987–December 1989*. Washington, DC: Center of Military History, US Army, 2008.