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AIRLAND BATTLE COMBAT AIRDROP
DOCTRINE AND REQUIREMENT

By LIEUTENANT COLONEL STEVEN R. HANNAH
AND
LIEUTENANT COLONEL EUGENE J. RONSICK

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AIR UNIVERSITY
UNITED STATES AIR FORCE
MAXWELL AIR FORCE BASE, ALABAMA

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AIRLAND BATTLE COMBAT AIRDROP DOCTRINE AND REQUIREMENT

by

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A RESEARCH REPORT SUBMITTED TO THE FACULTY

IN

FULFILLMENT OF THE RESEARCH

REQUIREMENT

Research Advisor: Lt Colonel Richard L. Skoog

MAXWELL AIR FORCE BASE, ALABAMA

11 April 1988

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AIR WAR COLLEGE RESEARCH REPORT ABSTRACT

TITLE: AirLand Battle Combat Airdrop Doctrine and Requirement

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Eugene J. Ronsick, Lieutenant Colonel, USAF

Combat airdrops have been and will continue to be an effective method of employing airborne fighting forces and resupplying combat forces once engaged. This study ~~will~~ looks at historical situations requiring combat airdrop as the primary means of insertion or resupply from World War Two to the present. Warfighting doctrine, along with modern warfare equipment and personnel attrition factors, have changed significantly over the past two decades. Against a historical foundation and the recent changes, the study ~~will~~ then analyzes the current doctrine for combat airdrop feasibility dictated by the modern AirLand Battle in the NATO central region. Finally, we ~~will~~ provide a subjective prediction of any changes required in that doctrine and the ability of current and future MAC force structure to meet the combat airdrop capability requirement. Low Intensity Conflict (LIC) and Special Operations Forces (SOF) will not be considered.

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BIOGRAPHICAL SKETCH

Lt Colonel Steven R. Hannah (M.S. Air Force Institute of Technology) has been a C-130 pilot since 1970. His many diverse assignments have given him a first hand look at the strengths and weaknesses of theater airlift. He began his career at Dyess AFB, Texas. Following a tour in Southeast Asia flying the AC-130 Gunship, he returned to Little Rock AFB, Arkansas, where he served as an instructor pilot and flight examiner. He later became an operations officer and commander of a C-130 AWADS equipped squadron at Pope AFB, North Carolina. During his career, he participated in numerous squadron deployments to Europe, both as a crewmember and squadron commander. He also managed a missile development program at Space Division in Los Angeles, California. Lt Colonel Hannah graduated from the Air War College in 1983.

BIOGRAPHICAL SKETCH

Lt Colonel Eugene J. Ronsick (M.A. Webester University) has flown the C-130 throughout his career in the Air Force. Stationed at Pope AFB, Little Rock AFB, and most recently Dyess AFB, assigned to tactical airlift squadrons as an instructor, evaluator, operations officer and commander. Familiar with theater airlift, he was one of the first copilots at Pope AFB combat qualified in AWADS. In late 1972 and early 1973, he was TDY to Thailand, where he flew over 100 combat missions, airdropping over 2000 tons of HALO CDS rigged supplies from an AWADS equipped aircraft in South Vietnam and Cambodia. He is a distinguished graduate of the US Army Command and General Staff College and taught Military Studies courses on Soviet Forces at the US Air Force Academy for three years. Lt Colonel Ronsick is a graduate of the Air War College, class of 1988.

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CHAPTER I

INTRODUCTION

The purpose of this study is to look at the doctrine that guides Military Airlift Command (MAC) in the employment of airlift airdrop forces in a combat environment. The mission of MAC covers the world. As defined by Air Force Manual (AFM) 1-1:

> "Airlift objectives are to deploy, employ, and sustain military forces through the medium of aerospace. The airlift mission is performed under varying conditions, ranging form peace to war. As a combat mission, airlift projects power through airdrop, extraction, and airlanding of ground forces and supplies into combat. Through mobility operations, the joint or combined force commander can maneuver fighting forces to exploit an enemy's weaknesses. As a combat support mission, airlift provides logistics support through the transportation of personnel and equipment. In peacetime, airlift provides th opportunity to enhance national objectives by providing military assistance and civilian relief programs. Airlift, therefore, accomplishes the timely movement, delivery, and recovery of personnel, equipment, and supplies, furthering military and national goals." (1:3-5)

We are going to deal primarily, with the most difficult of the combat missions listed above--airdrop. The United States Air Force (USAF) has maintained a significant airdrop capability over the years as a primary mission for airlift units. Since 1975, MAC has been the single manager for training and employing USAF airdrop qualified airlift forces and, with the recent addition of Special Operations Forces (SOF) under the control of 23d Air Force, MAC controls basically all of the United States airlift airdrop capability.

Since airlift and airdrop missions are support functions, MAC created the Airlift Concepts and Requirements

Agency (ACRA) solely to work with the owner of most of the airborne qualified armed forces, the United States Army. ACRA, in concert with United States Army's Training and Doctrine Command (TRADOC), works to develop the joint doctrine that will be used to coordinate the employment of airlift for Army units, to include airdrop of airborne forces. Together, they published a Qualitative Intratheater Airlift Requirements Study (QITARS) in late 1985. This comprehensive study covered the "...tasks and required capabilities of MAC's intratheater airlift fleet to support the needs of our combat commanders." (2:3-1) As one of our major source documents, QITARS proves that MAC and TRADOC are approaching intratheater airlift doctrine as a joint effort.

The purpose of this study is to analyze current airlift airdrop doctrine. First, we will analyze the doctrine against the lessons learned from past experiences--historical events. The sole purpose of airlift airdrop forces always has been and continues to be, to support and sustain the Army's combat operations by methods of aerial delivery. There are many lessons to be learned from past experiences. Are these lessons included and followed in our current airlift airdrop doctrine? Secondly, the recent introduction of the AirLand Battle (ALB) doctrine in the Army has created a great deal of comment, both good and bad. The substance of the arguments are not germane to this issue, what is important are three questions: Can the

Air Force support the Army's new ALB doctrine with the current airlift airdrop forces? Are Air Force airdrop doctrines congruent with the Army's ALB doctrine? Is our airlift airdrop doctrine feasible? Such is the purpose of this study. The conclusions that we reach will hopefully verify and confirm the success of ACRA and TRADOC staffs preparing the doctrine statements.

As can be seen from the biographical sketches, both authors have a great deal of recent experience in airlift airdrop operations and have witnessed events contributing to the development of airlift doctrine. For that reason, we feel that we are qualified to analyze the current doctrine provided to airlift airdrop forces. And as recent commanders, we have the first hand insight to evaluate that doctrine in light of Army requirements and provide analytical commentary on the effectiveness of the doctrine to guide combat commanders on the employment of airlift airdrop forces.

Since there are many definitions of what doctrine is and even more as to what it should be, we provide the following definitions. Doctrine is defined in AFM 1-1 as "...a statement of officially sanctioned beliefs and warfighting principles which describe and guide the best way to prepare and employ aerospace forces. Accordingly, aerospace doctrine drives how the Air Force organizes, trains, equips and sustains its forces." (1:v) Likewise,

"Aerospace doctrine is an accumulation of knowledge which is gained primarily from the study and analysis of experience." (1:v)

Webster's New Collegiate Dictionary gives almost the same definition. They define doctrine as:

1. TEACHING, INSTRUCTION
2. a: Something that is taught
   b: A principle or position or the body of principles in a branch of knowledge or system of belief: DOGMA
   c: A principle of law established through past decisions
   d: A statement of fundamental government policy especially in international relations, a principle accepted as valid and authoritative (3:336)

Since we will need common ground to start from, for the purpose of this paper, we would like to think of doctrine as principles of guidance, established through past decisions, accepted as valid and authoritative. The definition provides several insights into doctrine. First, it should be a principle of guidance. Second, it is developed from past decisions. Third, it is accepted as valid and authoritative. According to the definition then airlift airdrop doctrine should provide the principles of guidance for airdrops, be developed from past decisions concerning airdrops and be the accepted authoritative and valid source of guidance for airdrops. Against this definition of doctrine, we will analyze current airdrop doctrine.

The Air Force breaks doctrine down to three levels. Basic doctrine, the first level, which is "...the most

fundamental and enduring beliefs which describe and guide the proper use of aerospace forces in military action." (1:vi) Operational doctrine, the second level, describes "...the proper use of aerospace forces in the context of distinct objectives, force capabilities, broad mission areas, and operational environments." (1:vi) The third and lowest level of doctrine is tactical. AFM 1-1 defines tactical doctrine as "...describing the proper use of specific weapon systems to accomplish detailed objectives." (1:vi) For this paper, we will only look at doctrine concerning airlift airdrop forces on the first two levels, basic and operational. These two levels of doctrine are recorded in two areas, AFM 1-1 and AFM 2- series manuals. Tactical doctrine is considered tactics and cannot be included in an unclassified forum such as this paper.

Certain assumptions must be made to limit the scope of our endeavor. First, we will use a conventional conflict for defense of the central region of the Europe as our primary example. One the most demanding and intense combat scenerios that the Army faces in the world today, it will also be the most demanding for airlift forces. Second, we will assume that U.S. and NATO armed forces are engaged in combat in this region against forces from the Union of Soviet Socialist Republics (USSR) and their Warsaw Pact allies. The anticipated intensity of this conflict will provide a worst case threat array for the employment of airdrop forces.

Thirdly, airdrop forces and equipment are the hardest to maintain and employ, hence, more dependent on doctrine for guidance. For this reason, airlift airdrop doctrine was selected as our focus. Airlift doctrine and airdrop doctrine are intertwined and parallel in most cases. Our paper will deal with both, but concentrate on the airdrop portion, especially in the historical research area.
Likewise, formation of the U.S. Special Operations Command (USSOC) and the consolidation of the Air Force's SOF under 23rd Air Force in MAC have concentrated the development of clandestine and small unit resupply methods. Our focus will concentrate on the doctrine concerning airdrop sustainment of forces employed in an overt role, that is, with conventional forces using conventional tactics. Operations that require the use of special vision devices, extra-special qualifications and capabilities will not be considered. The SOF are logically governed by a separate doctrine.

In this paper, we will focus only on the basic and operational doctrine that govern airlift airdrop forces. The agenda for our analysis of doctrine will include the principles of war as we look at basic doctrine. Under operational doctrine, we will include factors considered germane to theater airlift employment: weather, threat and sufficient resources. As previously stated, we will not discuss tactics. The discussion of threat avoidance and tactics will be left to the appropriate major commands [illegible]

that are specifically tasked and properly classified to discuss those topics. With that in mind, we consider the airlift planners knowledgable in all the tactics available to airdrop forces and valid judges to consider the feasibility of each mission under the threat presence. We will deal only with the doctrine airlift planners and commanders have available for guidance. The report will look for doctrine to define the sufficiency of theater airlift airdrop forces to support the anticipated mission and the feasibility of that doctrine.

The paper will analyze airdrop doctrine in the following manner. First, we will analyze the historical threads of doctrine by studying past operations. Second, we will look at current doctrine, Army and Air Force, for consistency. Third, we will analyze current doctrine for the historical threads and feasibility to support the Army's ALB doctrine at the basic and operational levels. Finally, we will make recommendations based on our conclusions.

The purpose is not revolutionary or necessarily unique in scope. The perspectives that each author brings to the paper and a commander's analytical approach are the real heart of the effort. Doctrine is meant to be used by commanders to employ airlift forces. The conclusions at the end of this paper should express the authors' confidence in present doctrine to meet that basic goal.

CHAPTER II

HISTORY OF AIRDROP OPERATIONS

"Those who do not understand history are committed to repeat it"
Santyana

Introduction

To completely understand a subject, you must be aware of all of the historical factors affecting the development of the subject. For that reason, this chapter will look at the history of airdrop operations and explore how the doctrine to employ airlift forces developed in support of these operations. As we look at each operation, we need to separate the performance of the airlift forces and their contribution to the success of each.

To accomplish this task, we need to study the principles of war in each situation. Air Force Manual 1-1 lists the principles of war as: objective, offensive, surprise, security, mass, economy of force, maneuver, timing, tempo, unity of command, simplicity, logistics, and cohesion. (1:2-4 - 2-7) The employment of airborne combat forces exploits several of the principles. The first and foremost principles that the aerial delivery of paratroopers employs are surprise and maneuver. A key to the success of each of the following airborne assaults, surprise and maneuver, if applied correctly, always acted as a combat multiplier.

Also important to any airborne operation are the principles of mass and logistics. First, airlift insures mass in any airborne operation by getting the force to the drop zone (DZ) ready to fight and by placing them all on the ground in the correct location. Second, airlift insures the combat forces are sustained logistically until they can link-up with relief forces. If either one of these principles are ignored, an airborne operation is almost certainly doomed to failure.

The rest of the principles must be considered, but are primarily supportive of the four listed above. These four principles are a reminder for the reader, as we discuss why they either contributed to the success or failure of each operation detailed.

As mentioned in our Chapter I, we will discuss doctrine down to the operational level. To develop a view of this level of doctrine in history, we selected the following factors for consideration: threat, weather and resources. We selected these from a long list of factors as they have a direct effect on the ability to employ the four cardinal principles of war. By considering these factors, we will develop a much clearer view of historical lessons learned.

Pre World War Two

Colonel William 'Billy' Mitchell, General Pershing's head of air operations, had a much different idea about how to capture the city of Metz after the First Army's success at St. Mihiel in World War One. His plan for Metz was startling in its originality: he wanted to deliver 12,000 men by parachute behind German lines. It would require 60 squadrons of Handley Page bombers, each carrying ten paratroopers and two medium machine guns. Major Lewis Brereton, Mitchell's assistant built the plan. Pershing rejected the plan at the first look. (2:13-14) I am sure that General Pershing thought that Colonel Mitchell had consumed too much wine and had not fully recovered from the effects. This is the first real plan to consider an airborne assault. The most notable aspect of the plan was the massive amount of airlift that Colonel Mitchell felt it would take to put these forces in place, none of which was available at the time.

The Italians were the first to form parachute battalions in the late 1930s and used parachutes for logistic resupply of the stranded airship 'Italia' in 1928. (2:14) Though the Italians were the first to implement airborne resupply, they never really carried through with any great efforts after their initial successes. One reason for their failure to carry out their plans in large scale military

operations was insufficient numbers of large military transports to implement any plan.

"The real cradle of airborne warfare, however, was Russia." Starting as a sporting event, parachuting units were used in exercises by the Red Army in 1930. "By 1934, parachute forces were taking part in the annual grand maneuvers of the Red Army."(3:17) "...the more immediate value of such units was their capability for surprise attacks and for combat missions far behind enemy lines in areas otherwise inaccessible. Such advantages held great importance in the evolving 'deep battle' strategy associated with Marshall N.N. Tukhachevsky, the Soviet Deputy Commissioner of Defense. The Soviets first unveiled their new parachute airborne operations to the outside world at the 1935 Kiev maneuvers." (3:18) Foreign observers were impressed by this demonstration during military maneuvers. "...foreign onlookers, including delegations from France, Czechoslovakia, and Italy watched while...1200 paratroopers executed a major airborne assault 15 miles behind the 'Red' lines." (3:19) "...two waves of 20 TB-3 transports dropped the paratroopers, who then secured the area for the landing of subsequent transport aircraft on the runway." (3:20) Large aircraft were available and in sufficient numbers to lift the force to the drop area. The observers were treated to the first demonstration of the military use of large

numbers of paratroopers delivered by airlift using the parachute. Even at this time there was a weakness that Colonel Mithchell had implied as he urged the use of aircraft to transport paratroopers behind German lines in World War One. The heaviest armament they could carry was a light machine gun. "...As an Italian source indicates, they had trouble in destroying the strongest points of the resistance." (3:19)

The Soviets were not alone in their development of airborne warfare tactics. As the Soviets provided a secret place for the 3rd Reich's paramilitary organizations to train, the Soviet's new tactics using paratroopers did not go unnoticed by the Germans. In a rearming Germany, a young aviator named Kurt Student, went about the same business. In 1938, Field Marshall Herman Goering, Commander of the Luftwaffe, ordered Major Student to combine all airborne forces under the Luftwaffe. Student's work resulted in trained parachute units and Ju52 transports, an aircraft developed to deliver them. The 7 Fliegerdivision was formed. (2:17-20) It was the first case where the need to transport paratroopers had led to the development of an airlift aircraft specifically designed for that role.

Hitler observed the motivated units Student had trained and felt the combination of surprise and aggressiveness would fit well into his plans for western

Europe. He would use the paratroopers to seize key points and allow the Panzers to flow through to strategic objectives. Hitler made them a corps d'elite. Knowing they were not suited for a defensive slogging match, he would have them lead the offense. The airborne and Panzers coupled with the potent Luftwaffe produced "blitzkreig" warfare, unknown to Hitler at that moment. The paratroopers would prove themselves most deserving of the praise of their country. (2:21-23)

World War Two

It was soon time to test the value of the airborne forces leading an assault. In April 1940, the Germans launched a combined air, ground and sea attack on Norway and Denmark called 'WESERBUNG'. (2:43) The operation planned to neutralize the armed forces of both Norway and Denmark. The airborne assaults were vital to the success of the operation as they seized the Danish and Norse airfields the first day. These airfields would then be used to reinforce the airborne forces until they had linked up with the amphibious assault forces.

The Danish plan met with great success. The airfields were captured and the Danes quickly surrendered, overcome by the surprise and intensity of the attacks.

In Norway, the first phase was a success with the capture of Oslo and the airfields, but they were less

successful in exploiting the initiative. Norwegian forces reacted quickly. Immediate counterattacks on the airfields were successful. The lack of complete surprise resulted in paratroopers being driven from their objective at Naurik and finally capture at Dombas. (2:44-46) They had failed in Norway because they lost the element of total surprise and failed to secure reinforcements either by air or link-up with the amphibious forces.

Even the success of the German airdrops in Denmark and the flaws in Norway pointed out some problems that needed to be resolved. Just a couple were: "...how to control the force en route to the objective and a lack of heavy weapons to support the forces."(2:46) When the Norwegians recaptured the airfields, the German reinforcements were en route. The German headquarters knew this, yet were unable to recall the aircraft. The reinforcements were captured as they landed. With no reinforcements, the initial paratroopers airdropped in Norway were captured by Norwegian forces. This also points out the lack of sufficient airlift resources to achieve mass on the DZ as they needed more than one sortie per aircraft to transport all the paratroopers to the objective area. The Germans would work on, but not resolve all these problems. Others would learn the same lessons in the same manner later in history.

'FALL GELB', the plan for the capture of the Low Countries, also included the bold use of airborne forces. Again, they were to capture key bridges and airfields, hold them until reinforcements arrived. The 7th Fliegerdivision would lead the way with three parachute battalions and the airmobile 22nd Infantry Division would follow, being airlanded at secured airfields.

The plan kicked off on 9 May 1940. Airborne companies were dropped on three airfields with more paratroopers to airland an hour later. On two of the three objectives, the paratroopers were driven from the airfield. The aircraft with troops to airland were forced to crash land on the beaches with great losses. Only one airfield was secured with great difficulty. Even though the missions to secure airfields failed, the mission to secure the bridgeheads went much better. Although strong resistance was encountered at the bridges also, quick relief by the 9th Panzer division insured success. The victorious Germans called the total airborne operation a success, but paid a high price with the loss of one half of the 22nd Infantry Division, including 1600 paratroopers taken as prisoners of war and 117 Ju52s destroyed due to landing accidents. (2:47-51)

The operation cited above was called a success by the German staff, but in fact, it was a failure. The poor

logistical planning, poor logistical support of the German paratroopers on the airfields and the lack of enough mass to secure them led to loss of two of the objective airfields. This led, in turn, to a second logistical failure, the loss of the reinforcements. The paratroopers were most successful at the bridges where surprise and maneuver, coupled with mass and logistical reinforcement, insured the critical bridges were secured for the follow-on forces. It is also worth noting that the 22nd Infantry Division was the first "light" division, depending totally on airlift for reinforcement.

Eben Emael was a Dutch fortress that dominated all crossing sites on the Maas and Albert Canals within 16 Km. A garrison of 1200 men, it was a monument to the art of defense. Training at Grafenwofr, Hitler's elite airborne forces under Koch, incorporated glider tactics to perfect their plan for Eben Emael. On 10 May 1940, the plan unfolded. The targets were three bridges and the fortress itself. Two of the three bridges were secured immediately with the third bridge being destroyed while the Germans worked to dearm the charges. The fortress of Eben Emael fell to complete surprise and the deception of dummy paratroopers dropped to the west which confused the reinforcements. A stunning success for Koch's airborne paratroopers and gliders. (2:52-56)

Again, surprise and maneuver in a daring attack from above while deception insured mass and provided time for the logistical support to arrive. We completely agree with the author's quote: "The attack on the fortress of Eben Emael and the Albert Canal bridges...are the most efficient use of airborne and glider forces during World War Two. Employed with great economy of force, they brought off a stunning tactical victory." This operation also points to the benefit of joint training for paratroopers and airlift forces. (2:51)

Operation 'MEKUR' was the German airborne invasion of Crete. The plan was to land on Maleme and Canea, western objectives, in the morning with the second wave on the eastern objectives of Retimo and Herakleion with paratroopers and gliders, later in the day. Airland and seaborne reinforcements would exploit the initial successes.

On 20 May 1941, the operation began with an airdrop at Canea around the prison south of town. The New Zealand defenders were combat hardened veterans as were the defenders at Maleme, where the airdrop came about the same time. From their arrival forward, the Germans fought not to exploit success, but to survive. The New Zealanders fought vigorously in the defense of the objectives in the east. In the west, heavy defenses and landing casualties had the initial battle hanging in the balance. Reinforcements were slow to come as aircraft were as much as two hours late

departing Greece with the second lift and, disoriented, they dropped the fresh paratroopers on prepared defenses and into rough terrain. Not one initial objective had been captured by German forces as night covered the battlefields.

The next morning, Ju52s landed on the beaches with supplies north of Maleme. Landings on the airfield were being forced at great loss of aircraft due to enemy artillery fire. Supplies were low and the promised reinforcements were not arriving in good condition. The seaborne forces met with disaster at the hands of the British Navy, which sank all the vessels transporting them.

The third day of the operation saw the battle for Maleme continued. The tide turned as the British artillery observers were displaced and denied a view of the airfield. Fresh troops in good condition began to arrive in earnest via an airbridge from Greece. The British naval forces that had destroyed the German seaborne forces were devastated by German aircraft and the New Zealanders could see the end as the Germans regained control of the air. Canea fell to the Germans on 27 May and on 29 May eastern and western German forces linked up. During the nights of 28-31 May, the Royal Navy performed the herculean task of rescuing 17,000 men from Crete under attack by German airpower. This success for the Germans had been costly. One in three paratroopers on Crete had been killed. This was the German airborne forces last

victory, of which Hitler said "The day of the paratroop is over...surprise, the key to successful operations, will never again be possible." (2:62-73)

I agree with Hitler on the fact that after 'MEKUR', the day of the German paratrooper during World War Two was over, but not because surprise would never again be possible. In 'MEKUR' and all the previous examples of German use of airborne forces, they had stubbornly relied on surprise and initial maneuver as the pillars of each operation. They had developed the Ju-52 transport for logistical resupply and became so infatuated with the use of the air, they forgot to sufficiently plan for the critical logistical link-up with ground or amphibious forces. German paratroopers fought well in every endeavor, including 'MEKUR'; but as previously stated, the control of the entire airborne force was under the Luftwaffe. It is our personal opinion that due to an oganizational flaw, not all the combat power of the Germans could be brought to bear effectively in support of airborne forces. The airdrop operation required two sorties to insert the airborne force. Obviously, not enough airlift was available to insure mass on the objectives. Again, airfield objectives were crucial to sustainment and, as in 'FALL GELB', they failed to secure them in time to insure resupply. The successful operations were always quickly linked-up with ground forces or provided airlift sustainment. The Luftwaffe

would later be unable to provide sustainment for ground forces at Stalingrad with disastrous results.

The British were not idle while all this was taking place. They also decided that airborne forces would play an important role in future operations as World War Two approached. The Royal Air Force (RAF) was involved in the planning and development of airborne operations from the very beginning. "An official historian wrote '...it is worth noting, not for reasons of sentiment but from a purely practical point of view, that excellent co-operation had been achieved between the two services. ... each service (RAF and Army) learned to rely implicitly upon each other, and from this trust has developed an intimate co-operation at all levels which formed the basis for planning for the future.'" (2:82) This facet of the forces' development would pay big dividends in the future.

British paratroopers were first used on 10 February 1941 in operation 'COLOSSUS'. Six bombers took off from Malta; five dropped their paratroopers in the right valley and the sixth missed completely. The target was the main aqueduct for the regional water system in Calabria, Italy. Only a small portion of the group actually reached the aqueduct and when they detonated their explosive charges, did little damage. They did attract the local police who quickly captured the entire force. None of the paratroopers returned

the rendezvous with the submarine sent to recover them. (2:76-80)

This was a rather bad start. They achieved maneuver and surprise but not mass. There was no logistic support even planned. Even though the RAF was in on the planning, execution by the airlift was poor at best.

On 28 February 1942, the British tried their second airdrop operation called 'BITING'. One company divided into three parties was airdropped on the German radar site at Bruneval. One party secured the radar site for examination, one subdued the German troops garrisoned at the site while the other group subdued the garrison for shore defense in the village of Bruneval. Total surprise was achieved. All German troops were subdued. Before dawn a flotilla had picked them up from the beach and they were back across the channel with the desired equipment and information. Only one paratrooper had been killed and seven injured--very light casualties. Churchill was impressed and gave his full approval for the development of the budding airborne forces. (2:86-87)

This example is the classic employment of an airborne force for a specific mission. Well planned and executed, these paratroopers surprised the small garrison of Germans with swift maneuver. They applied the correct amount of force at all the critical points and their logistical support

for both insertion and withdrawal was timely and accurate. There are few airborne operations that will go as smooth as 'BITING'.

The Americans had also developed an airborne capability, but with a few differences. Allied airlift aircraft were different from the very start. The British initially used bombers as the main paratrooper carrying aircraft, while the Americans arrived trained and ready to jump from the C-47. The C-47 was a passenger aircraft converted to excellent use as a troop carrier. It would become the backbone of airlift forces. As bomber assets were much harder to schedule, the British were forced to switch to the C-47 also. Till RAF crews were trained in the C-47, they had to fly with American crews.

Airlift was a critical factor in the fall of 1942 as the Allies were planning operation 'TORCH', the invasion of French North Africa. The first American unit to go, 2nd Battalion of the 503d Parachute Regiment, readied for combat. Fourteen C-47s manned by untrained United States Army Air Force (USAAF) crews tried to fly formation in bad weather for 1500 miles to an obscure drop zone on an airfield. Poor navigation coupled with bad weather and low fuel forced many of the planes to land in the area of the airfield when they experienced ground fire while trying to land on the drop zone. There was no airdrop because the planes had to land to

refuel. Spread out and disoriented, the paratrooper commander tried to regain some control only to discover when he arrived on the objective by bus, the US 1st Armored Division had already taken the airfield at Tafaraoui. The 1st Armored Division left the 2nd/503d to keep Tafaraoui Airfield secure. Only luck kept the 2nd/503d from airdropping on top of the 1st Armored Division and engaging them as the enemy. (2:91-92) American airborne operations and their airlift support were not off to a good start.

The following statement best describes the first American attempted airborne assault: "There had been little planning, intelligence was non-existent, the aircrews lacked the necessary training to make combat airdrops." (2:92) This episode is an example of how fragile airborne operations are and that a great deal of planning and training must accompany each operation or the result will be a disaster. The 2nd/503d, retitled the 2nd/509th, were to get another chance after their failure on their first mission. Shortly afterward, they were scheduled to airdrop and seize Souks-les-Bains. On 15 November, they were airdropped on target and met on the ground by the Vichy French with open arms. (2:93) The American airborne force had their first success.

On 29 November 1942, the 2nd Battalion of the British 1st Brigade, were loaded on 44 C-47s of the 62nd Troop

Carrier Wing (TCW). After a 400 mile flight to a drop zone no one had ever seen, with no reconnaissance or aerial maps, they jumped into a deserted airfield at night when they couldn't land as planned. They quickly formed and moved off to the objective, 10 miles distant. The Germans were surprised, but quickly reacted, attacking the force with tanks and aircraft. Lt Col Frost, the commander, was informed link-up forces were not coming. They withdrew at night, as they were short of ammunition and rations and had no defense against the tanks or aircraft. For three days, they walked toward allied positions. Over half of the battalion was lost during this mission and subsequent retreat. The message was complete. Without support, airborne paratroopers cannot survive for a long period of time against heavier forces. (2:94-95)

The British had experience. They were lucky when they arrived on the correct objective for this mission given the inexperience of the airlift aircrews. Surprise was complete but everything else was forgotten. Maneuver, mass and logistics were left to chance. These paratroopers were lucky; their mission failed but at least half of them escaped with their lives. The lessons learned in North Africa by airlift and airborne leadership were: aircrew experience is critical, command and control of the force en route must be maintained, and joint training is a must. (2:95)

Sustainment by airlift and airdrop was first put to the test in Russia during World War Two. The German 6th Army with 20 divisions and 300,000 men were surrounded at Stalingrad for 90 days late in 1942. (4:280) Goering saw the Stalingrad airlift as a way to improve his standing with Hitler after his failure to win the Battle of Britain. The 6th Army required a minimum of 500 tons a day and desired 700 tons a day. (5:108) Goering's staff told him and Hitler they couldn't come close to supporting even the minimum lift requirement. "Seven hundred of the invaluable, tri-motored Ju-52s were being used in Africa and there were not enough left for southern Russia." (4:266)

Goering's staff was correct. They never approached the minimum figure. The maximum delivered in one day was 289 tons and the total averaged under 100 tons a day. (5:108) The Ju-52 pilots fought weather and Russian fighters with extraordinary courage, but with little hope of succeeding in their mission. (4:266) Field Marshall Paulus and his 6th Army could not fight Soviets and the Russian winter without supplies. They surrendered on 1 January 1943. (4:280)

The resupply of the 6th Army failed because of poor leadership. The principles of war were totally ignored. There was not enough airlift to go around for all the German theaters. Many of the German Ju-52s were tied up in North Africa supporting Rommel. Airlift, the critical link,

failed. Stalingrad was the turning point, starting the German retreat on the Eastern front.

Operation 'HUSKY' was the code name for the invasion of Sicily and 'LADBROOKE' for the airborne portion of the invasion. The 505th Parachute Regiment commanded by Col. James M. Gavin, was flown to Sicily by untrained C-47 crews. They became disoriented and over flew the 'HUSKY' invasion fleet. The invasion fleet opened fire and several aircraft were shot down en route. The surviving transports dropped paratroopers all over the west end of Sicily. Only one company landed on the DZ. Other units landed as far as 60 miles from the correct DZ. One eighth of the force gathered into a cohesive unit and the rest fought as individuals and small groups. (2:102)

Although the lessons in North Africa cast some doubt about the effectiveness of airborne operations, the invasion of Sicily in July 1943 needed the combat multiplier that vertical maneuver offered. Surprise was evident on this operation, but maneuver was poorly executed by the USAAF airlift crews. "With neither prior experience nor a joint command or planning organization to guide this first large-scale assault...allowed aircrews little time to practice the new tactics,...but troop carrier leaders were optimistic." (6:5) Their optimism was ill-founded. "The problem had been one of delivery rather than the concept of

mass employment of airborne forces; the result was further training for troop carrier units. (6:6) Mass and logistical support were lost completely due to the poor performance of the transport crews. The mission, the first for the three battalions of the 505th, was a tactical failure. The invasion of Sicily was a success, however, and the paratroopers proved themselves to be tenacious fighters even though they never formed into a cohesive combat unit. This reputation would follow all paratroopers, Axis and Allied, throughout the war.

Lt General Patton, Commander, 7th Army, decided to use paratroopers in an airborne reinforcement role by airdropping two battalions of the 504th Parachute Regiment plus a light artillery battalion and an engineer company at night, within the American beach-head at Farello airfield on 11/12 July 1943. Again, the transports were fired upon by allied ships. Twenty three of 144 C-47s were lost and 37 badly damaged. Shaken, jumpmasters forced their paratroopers out early. Out of 1900 men, only 400 arrived on Farello airfield. The rest, falling out of the night sky on surprised American units, were shot in the risers. Nightfall on 12 July found only 558 officers and men of the 504th fit to fight. (2:103)

This failure can, again, be directly attributed to the transport crews. Poor training, compounded by bad

navigation, cost slightly less than three quarters of this unit, their lives. The mission also pointed out the need for coordination on link-up procedures between ground and airborne units. This was the darkest day for the USAAF airlift crews. "Experiences in Sicily emphasized the need for a joint airborne planning headquarters...the key airborne warfare lay in concentrating paratroopers and firepower on the ground, a function of thorough planning and proficient troop carriers." (6:7)

During the same operation, the British 1st Parachute Brigade went in against the Primasole Bridge on 13 July 1943, carried by the 51st TCW. Pathfinders were inserted early by airdrop to mark the DZs with lamps, so the troop transports could find the DZs. This was the first time they were employed. (2:104-105) The procedure worked. The 1st, 2nd, and 3rd Battalions made the jump. Unfortunately, the Germans had also selected the Primasole Bridge as an airborne assault objective. The 4th German Parachute Regiment were on the same DZs.

To add to their problems, the 51st TCW had a bad night navigating to the DZs. Eleven C-47s were shot down by friendly fire and 27 failed to reach the DZs, returning their loads to North Africa. The British jumped on German paratrooper positions. The Primasole Bridge was secured,

lost and regained in the same pitched battle by the hardened British paratroopers. (2:104-105)

This particular airborne assault is one of the few times two airborne forces engaged one another in combat. The mechanics of the mission for the British were hampered, again, by poorly trained USAAF transport crews. Mass was lost, surprise and maneuver were marginally attained. The British won the confrontation only because most of the experienced Germans paratroopers were lost on Crete in 'MEKUR'. No thanks to the performance of the transport crews, the mission was a tactical success.

The Allied airborne assault into Sicily appeared a costly failure and almost resulted in the termination of continued developments in this field. Despite this, the enemy was impressed by the quality of the airborne paratroopers and their disruptive effect. (2:105) The aggressive airborne reputation mentioned earlier, was deeply imprinted.

Paratroopers were tough fighters, but they had obiems getting to the DZs. General Eisenhower called for a board to investigate the problems the airborne operations were experiencing. "Headed by MajGen Joseph W. Swing, the Swing Board concluded that parachute and glider troops should not be sent on missions unsuited to their capabilities or on tasks which could be more economically or equally well

performed by other means. Eisenhower accepted this finding and demonstrated his whole hearted support for the large scale use of airborne formations..." (2:107) Paratroopers were valuable fighters, but they needed to be used for the right missions. "The biggest problem that faced airborne forces was their inability to extricate themselves from a dangerous situation or to redeploy elsewhere in the same theater of operations. They were on one-way tickets that had been launched on the assumption that relief by advancing forces could be accomplished within a few days." (2:107) Eisenhower realized their vulnerabilities and in future decisions, he demonstrated an understanding of the very fragile, fleeting advantage of surprise, maneuver, and mass. He also understood sustainment meant the difference between success and failure of airborne missions. Airborne operations were not cheap. The cost of using this force is best explained by the following quote: "The bill for getting an airborne division into battle was hair raising and the mechanism for launching it delicate in the extreme." (2:110) This unknown staff officer knew what it took to employ airborne forces.

The planning for 'OVERLORD', the invasion of Europe, started and there were various ideas for the use of airborne forces. The 'Marshall Plan' envisioned an assault by two Allied airborne divisions in the Evreux area of France to

create an expanding airhead into which a massive airlift would bring reinforcements to attack German lines of communications, keeping reinforcements from the beach-head. As soon as possible, amphibious forces would make contact with the airborne divisions and drive for Paris. Eisenhower rejected this plan in favor of one that placed the airborne divisions on the flanks of the landings. (2:112) Fortunately, Eisenhower foresaw the tremendous effort required to reach an "airborne island" at Evreux with logistical support. If the island failed, the invasion failed. He wisely selected a plan he could sustain logistically.

The British airborne assaults for 'OVERLORD' went well in the early morning of June 6, 1944. Most paratroopers landed on DZs marked by their pathfinders. The supporting gliders were on target. (2:120) This was due in large to the recent qualification of RAF crews in the C-47 and the result of previous joint training on night airborne operations. The British employed all the principles of war. Their work paid off as their logistical support was on time and on target.

The American airdrops for 'OVERLORD' weren't as smooth. On 6 June, 821 C-47s carrying 82nd and 101st Airborne divisions, headed for France. (6:8) Due to weather and the lack of qualified navigators, "Of the 13,000 American paratroopers dropped, less than 10 percent landed on their

DZs, but 60 percent landed within two miles of their zones." Despite this the paratroopers were successful in seizing their objectives. (6:9) The 101st Airborne Division jumped south of St Mere Eglise and were widely scattered. Only 15 percent landed close to their assigned DZs. Over half of the equipment landed in swamps and was lost. The 82nd Airborne Division jumpmasters pushed paratroopers out the door regardless of the position of the aircraft, many too low. Once on the ground, those that survived the jump, fought well. (2:121)

Reliance on beacons for navigation caused some of the problems for USAAF transport crews. As a result of this performance, the Americans stopped all night parachute drops, a problem that would hamper a later operation. Shortages of support weapons and ammunition plus immobility once on the ground were acutely felt by all the forces involved. (2:125) Most of the problems were caused by poor mass, maneuver and logistics. Due to poor positioning over the DZs, the paratroopers lost most of their meager equipment and were badly disorganized. Fortunately, the confusion caused by the surprise of the drops and the invasion fleet created chaos among the defenders. As usual, once on the ground, they fought well, but not as cohesive units.

Slowed by Hitler's invasion, the Soviet High Command wasn't able to put together their first airborne operation of

the Great Patriotic War until January 1942. They planned a giant pincher movement by the 33d and 10th Armies to trap the German armies at Vyazma. The airborne force's mission was to establish an airhead within the 4th Panzer Army rear area by seizing airstrips. Airlift of reinforcements to support the airborne forces would follow and ultimately link up with the 33d Army. The 10th Army would then launch the left hook maneuver.

On 3-4 January a battalion parachuted onto the airstrip at Myatlevo only to find it covered in deep snow. They worked all day to clear the strip under German fire. Weather cancelled the scheduled airlift on 5 January and the whole airlift reinforcement plan was cancelled the next day. The parachutists formed guerilla bands and fought their way back to their own lines in two weeks.

The main battle developed on 18 January when two battalions were airdropped, unopposed at Lugi. They held the airstrip; and over the next five nights, transports arrived with reinforcements. On 25 January they linked up with elements of the 33d Army. The high command decided that now was the time to commit the main body of the 4th Airborne Corps. On 27 January they airdropped two battalions with poor accuracy, behind German lines. The Germans harassed the paratroopers, shot up the transports trying to resupply the paratroopers and finally broke up any attempts for the widely

dispersed units to link up. On 3 February, the 33d Army attacked, expecting to meet a 4th Panzer Army harried by parachutists in their rear areas. Instead, they were faced by a well organized and prepared defense. Then on 23 February, the Russians airlifted the last of their 7000 airborne reinforcements to the airhead at Lugi to no avail. On 25 March, the Germans launched a counter offensive and an early thaw on 18 April stopped all maneuver, so the Germans policed the remaining paratroopers up with a fierce revenge. The entire plan failed. (2:127-129)

The first army to ever demonstrate the ability to employ airborne paratroopers failed on their first attempt. Surprise, maneuver, mass and logistic support were never achieved. The result could have been predicted by the lack of planning, employment of forces in a dribble fashion, and the failure to provide any logistical support once committed to battle. The Russian paratroopers were tenacious fighters, but poor employment techniques cannot be overcome by determination.

Over a year passed before the next Soviet airborne operation. The Germans were withdrawing in September of 1943 at the Dnieper Loop. Soviet airborne forces were to seize a lodgment on the far west bank. Three Germans divisions were crossing the bridge at Kanev with one Panzer division left to cross. The paratroopers were told the Germans were in full

retreat and disorganized. Over 180 aircraft were scheduled, but on the night prior to 23 September, only 8 aircraft materialized. The weather turned bad and delays started. On the morning of the 24th, more aircraft arrived. Loading started, but loading tables and passenger manifests were scrapped. Once loaded, the pilots insisted on unloading to count heads for weight and balance. Chaos reigned, refueling was inadequate, aircraft moved to other nearby airfields for fuel and the paratroopers marched overland. Finally, an anonymous individual gave the order to take off single ship when loaded. The Panzer division was fighting a delaying action when transports appeared overhead. They were shot out of the air and the paratroopers shot in their risers. The entire operation failed.

It was the last Russian attempt to mount an airborne attack. The Soviet high command felt the contributions of airborne operations did not off set the need for airlift assets used in a logistical resupply role. (2:129-133) They could never dedicate the airlift forces necessary to achieve any degree of success and they ignored the major principles of war.

In the Pacific, the effective use of airborne forces was not lost on the Japanese. Limited transport aircraft and the great distances between islands prevented frequent use of Japanese airborne forces in the Pacific. Yet on 11 February

1942, the Japanese first used their airborne forces to "rescue" an oil refinery at Palembang. They airdropped 130 paratroopers onto the refinery as the Dutch tried to destroy it. The paratroopers saved 250,000 tons of valuable oil and lost only 25 personnel in defeating a much larger force. (2:134) They employed all the principles--surprise, maneuver, mass and logistic sustainment. It is no wonder they were successful.

The second use of Japanese airborne forces occurred in December 1944. The Japanese tried to stop the Americans at Leyte with paratroopers. The initial attempt was a total failure when all three troop transports were shot down. Next, they used 30 to 40 transports and assaulted an airstrip, attempting to destroy aircraft, with no hope of reinforcement. They landed among the 11th Airborne Division, who quickly realized the attack and had the last one policed up 48 hours later without many problems. (2:135)

This was the second incident of airborne forces fighting airborne forces. The first occurred in Sicily at the Primasole bridge. The Japanese failure was sealed in the words, "no hope of reinforcement". Other than being a harassing force, they were completely wasted. Their use in this role reflects the "kamakazi" mentality of the Japanese at this stage of the war.

Operation 'THURSDAY' in Burma was unique., the Supreme Allied Commander in South-East Asia. Wingate planned to cut the Japanese lines of communications to the north of Burma and trap their forces in North Burma. "Air supply was the key to jungle warfare or, for that matter, any warfare in countries where roads were rare and difficult to build..."(7:6) The 10th Air Commandos were formed to support Wingate on this operation. The Chindit forces were employed. Gliders established airheads and 12,000 Chindits were airlifted into the enemy's rear area. (2:139) "In the end of 1944...the fleet of transport aircraft available to 14th Army...was larger than anywhere among the world's battle fronts...the tonnage of stores flown to forward paratroopers exceeded, for 14th Army alone, 2000 tons a day." (7:7) One division (36th British) had 7 DZs operating at the same time. The air supply planes made 250 sorties a month in all weather. (7:230) Resources and forces to succeed were allotted to the mission--it was a success.

This particular operation proved the worth of the theater airlift used to totally resupply a light fighting force. The 10th Air Commando C-47s airdropped and airlanded supplies for the Chindits throughout the entire operation. The low enemy density in the theater was a positive factor in the success of the effort. The Chindits, sustained by airdropped supplies, employed surprise, mass, maneuver to

harass the Japanese for a long period of time. "...31 Squadron of the RAF and the 2nd TCS, USAAF, pioneered air supply..." (7:105) Unlike Stalingrad, the second use of airdrop as a sustainment lifeline proved successful.

In September 1943, the 503rd Parachute Infantry Regiment was first employed by General MacArthur. Lack of airlift had hampered any use prior to this time. They were airdropped onto the airstrip at Nadzab, 20 miles inland from the beach-head being assaulted at the same time. The airdrops were unopposed but had problems. As usual, some men missed the DZ and those that landed on the DZ found the grass to be 12 foot high and difficult to move through. Fortunately, the airfield was undefended and proved to be an easy target. The operation was a complete success. (2:140)

The timing of this operation was critical to the survival of all allied airborne forces. At the same time, the Swing board was meeting in Washington D.C. The failures in Sicily alone, without the success of the 503rd, would have have surely resulted in the same conclusions as the Soviets came up with--airborne units were too expensive for the return in combat power. The assault on Nadzab worked. Surprise and mass were excellent, but maneuver on the ground, poor. Logistical sustainment was excellent. General MacArthur insured the link-up with amphibious forces for

resupply. This feature became part of all Pacific airborne assaults in the future.

The next objective was Noemfoor airfield ten months later, on 3 July 1944. The first battalion airdropped 24 hours after the amphibious assault. Surprise was complete as the enemy garrison was tied up with the beach assaults. An altimeter error caused the drops to occur as low as 200 feet above ground level (AGL), causing many injuries to the jumpers. The second battalion came in a day later with almost as many casualties. Of 1400 men airdropped, 10 percent were unable to fight due to injuries during the drop. Due to this fact, the last airborne battalion was brought in over the beach.

The operation was a success only because the enemy strength was completely overestimated. (2:141) A successful operation, but no thanks to the transport crews. Surprise and maneuver were present as well as logistical support. Mass was almost lost when so many of the paratroopers were unable to fight due to an altimeter error. The Pacific was not without some of the problems that plagued the European Theater of Operations (ETO). The poor aircrew performance was attributed to poor training and no rehearsal. (2:141)

MacArthur's 11th Airborne Division, unused in the airborne role, got their first chance at Tagaytay, Philippines on 3 and 4 February 1945. Pathfinders deployed

and set up DZs along Route 17 to Manila close to the Aga Defile. Available airlift limited the drops to one battalion at a time, so two battalions went in on the first day in two separate lifts. The first lift started well, but a jumpmaster misidentifed the DZ and 30 plane loads of paratroopers landed miles to the northeast of the [illegible] area. The battalion on the next lift landed in the [illegible] area because the jumpmasters saw the discarded p[illegible] the first drops on the wrong DZ. They deposited the jumpers there also. The third battalion, airdropped the next day, all landed on the correct DZ. The three battalions got together a cohesive attack on the Aga Defile and [illegible] door to Manila. (2:143)

Again, in this effort, the transport crews were critical to the operation. The 11th used the British tactic of employing pathfinders to mark the DZs for the air crews. This usually successful tactic failed when jumpers on the ground were used as an aim point; unfortunately they were not on the DZ. Even though mass was not achieved initially the assault succeeded. The operative words in the account are "cohesive attack". The three battalions got themselves organized and opened the one narrow choke point on the [illegible] to Manila. Maneuver and surprise aided them in their success, as the Japanese never expected an attack from the ridge.

A short time later, the 503d, unused since Noemfoor, were given Corregidor Island as their objective. Fortified and small, it presented a difficult target for an airborne assault. A coordinated airborne and amphibious assault was planned on 16 February 1945. The DZ, the old parade ground, was only 400 yards long and half as wide and the golf course even narrower. The 317th Troop Carrier Group (TCG) had only five seconds over the DZ on each pass. More than one pass was required to complete the airdrops. High winds carried the first paratroopers wide of their target and into barbed wire and ruined buildings. Accuracy improved with succeeding passes. The airborne assault caught the Japanese completely by surprise. Intelligence had underestimated the enemy strength, but the Japanese commander was killed early in the fighting which denied the enemy a coordinated defense. The amphibious landing came ashore, as planned, and joined to defeat the enemy quickly. Over 10 percent of the paratroopers sustained injuries during the airdrop, rendering them unable to fight; but the operation was a complete success. (2:145)

Probably the most difficult DZ in the Pacific, the close coordination of the transport crews and the 503rd successfully compensated for the high winds on the DZ. Surprise and mass achieved by maneuver, along with support from the amphibious assault, assured success.

The most successful operation in the Pacific was the airdrop at the Los Banos prisoner of war camp. Although small in scope, it proved the worth of planning, good intelligence, and surprise. One company was airdropped on the camp in the morning while the 275 guards were separated from their weapons during their daily physical exercises. Amtracs from a coordinated amphibious landing sped into the camp at the same time, while a diversionary ground attack several miles away, drew off all the reinforcements. The company landed among the Japanese and quickly killed them while they only lost one man. All the prisoners were loaded on the Amtracs and taken to safety. The effect of this raid on morale was tremendous. (2:147)

All aspects of this airborne operation were perfect. It demonstrates the capability of precisely coordinated and planned operation. As usual with a operation this successful, all primary principles of war were achieved to the maximum. Another reason for mentioning this particular operation is the tremendous effect on the morale of the troops throughout the theater. The spectacular success of an airborne operation can be a very positive morale booster. This is the positive note that the airborne operations in the Pacific theater ended on.

Back in Europe, the first airborne operation of 'OVERLORD' was code named 'RUGBY'. The Rugby force

consisting of over 5,000 paratroopers, six battalions and one brigade composed of American and British units, airdropped on the French Riviera on 15 August 1944 from bases in Italy. It was a poorly kept secret. German intelligence knew that an airborne attack was coming to southern France. (8:72) The complex plan turned into a nightmare when fog blanketed the DZs and troop carriers scattered units, supplies and equipment over the entire region, some as far as 25 miles from their objectives. (8:78) Despite the bad start, 85 percent of the paratroopers assembled on their objectives by 0800 in the morning. Follow-on logistical support, over 4,000 men and their equipment, arrived on time and in good condition. By D+1, the Rugby force had more than successfully completed its mission. In 987 sorties, airlift had delivered 9,732 troops and over 1100 tons of equipment. (8:79-82)

The War Department would say this was one of the most successful airborne operations of the war because of precise timing and the few injuries incurred during the jump by the paratroopers, only 80 reported. (8:79) This is one of the few operations where surprise was lost and the operation was a success. Weather caused the major problem, denying Rugby force mass on the objectives, but the paratroopers quickly overcame the problems by sheer determination. The allied airborne operations were improving.

There were operations still being planned in the northern ETO also. Between 13 June 1944 and 10 September 1944 no less than 16 major airborne operations were planned at short notice by the 1st Allied Airborne Army or 1st British Airborne Corps. All were cancelled, either because the situations they were designed to meet failed to materialize, or because the speed of the Allied advance rendered them superfluous. (2:152) Eisenhower gave Montgomery use of the Allied Airborne Corps to appease Montgomery's ego. Given the forces, Montgomery was determined to employ them--operation 'MARKET GARDEN' was born.

'MARKET', the airborne phase of 'MARKET GARDEN', was planned to assist 2nd Army, under Montgomery's command, in its advance towards the Zuider Zee, using the 1st Allied Airborne Corps to "capture and hold crossings over the canals and rivers on 2nd Army's main axis of advance from about Eindhoven to inclusive Arnhem". (2:153) The largest airborne operation to date, it was daring and complicated. We could spend the whole paper discussing the plan, but here are the main facts:

Factors affecting the planning of 'MARKET GARDEN':(2:153-156)

-A spirit of optimism, "over by Christmas"

-Destructive competition over resources by

Montgomery and Patton

-Hesitation in execution of the plan

-Over stress and apathy among the airborne units

-No confidence in night airdrop capability by Americans

On Sunday, September 17, 1944, Operation MARKET GARDEN, the largest Allied airborne operation of World War Two, launched 1544 transport aircraft carrying 35,000 American, British, and Polish paratroopers toward the Netherlands to hold a bridgehead across the lower Rhine at Arnhem. (9:1) The weather cooperated, but other factors caused problems:(2:159-168)

-The Airborne Corps Commander, Browning, dropped in the 82nd area, but could only communicate with the 82nd and the Corps rear HQ

-The Germans captured plans of the entire operation carried into battle

-Bad interpretation of intelligence underestimated the German strength at Arnhem

-Poor progress by 30th Corps to relieve Arnhem

-Three lifts required to insert all the airborne forces

The common reasons cited for MARKET's failure are as listed: (2:169-171)

-Decentralized planning, air commanders picking DZs

-Underestimated German strength

-Lack of or poorly coordinated fighter support

-Poor communications between units

-Insufficient airlift forces

Montgomery went to his grave calling MARKET GARDEN a success, when in fact it destroyed the strategic reserve of the Allied Armies in Europe. The 1st British Airborne Division was surrounded and destroyed. The objective bridge at Arnhem was not secured. A heroic airdrop resupply effort to support this unit isolated at Arnhem failed. As with every other airborne operation that failed, basic principles were ignored. "... surprise is an important factor that enhances an airborne operation's chance of success. Lt Gen Brereton felt that MARKET could only achieve full surprise if all airborne forces landed at the same time." (9:9) Surprise was given up by the lack of sufficient airlift to place the entire force on the DZs on the first lift. "Air transport was unavailable in sufficient numbers to allow the MARKET force to be committed simultaneously. ... the landing stretched over three days." (9:9) Mass was distributed over a "corridor of airborne forces". Maneuver and logistical resupply were ignored by an over optimistic commander and staff. Basic reasons, but a big failure.

The Battle of the Bulge gave airlift and airborne armies their next challenge. Shortly after 0300 on

December 1944, the remaining German airborne army was delivered into their last battle. "Germany had very few trained paratroopers left and no specially trained pilots at all to drop them, and the whole operation quickly came unstitched. Just ten of 105 transport planes reached the proper DZ near the town of Malmedy, fifteen miles behind the American lines. A dozen pilots became so befuddled in the darkness that they released their paratroopers over the peaceful German city of Bonn, fifty miles away." (10:36-37) The commander, Baron Heydte expected to have a thousand paratroopers on the objective, he ended up with less than thirty. They were unable to take any of their objectives, key road centers and bridges, much less hold them. Heydte was captured five days later. (10:37) Hitler's prophetic words that the day of the paratrooper was over after "MEKUR" had come true for the Germans.

This last German operation is the best example to prove the point for joint training of an airlift and airborne force. Without accurate delivery, the paratroopers were unable to achieve mass and did not receive the logistical link-up they needed for survival or success.

Surrounded by German forces during the Battle of the Bulge, the 101st Airborne Division was locked inside the town of Bastogne. Without resupply, they were very likely to be overrun by German forces before General Patton's Third Army

could break the siege. So on December 23, 1944 "At [illegible] a C-47 transport plane appeared over the town and a team of pathfinders parachuted into the perimeter. They set up radar sets and brightly colored cloth panels to guide a great fleet of transports on the way from England. By noon the crisp blue sky over Bastogne was filled with silver planes spilling out supply bundles under vivid red, blue, green and yellow parachutes. German anti-aircraft fire knocked down several of the C-47's but the pilots of the rest never wavered. GI's collected containers of ammunition, food, clothing, blood plasma for the wounded, and gasoline for LCB's tanks. Fully ninety-five percent of the 144 tons of supplies landed safely within the perimeter." (10:85) In the next few days, when the weather permitted, the Air Force delivered almost a thousand tons of supplies to Bastogne. (10:86)

The airlift forces had come to the rescue of Bastogne. Despite enemy ground fire and weather, the airlift kept the 101st Airborne a viable fighting unit until relief forces arrived. An indication of the effort, "C-47s made 1,000 airdrops of food and ammunition" to the beleaguered town of Bastogne. (6:12) The valuable training the crews had received during previous operations "OVERLORD" and "MARKET" paid big dividends for the 101st Airborne. The success

this airlift effort would set the stage for even more heroic resupply efforts by airlift forces in the future.

The Allied airborne forces had one more chance to prove their value and end the war on a positive note. Operation 'VARSITY' used two airborne divisions to secure crossings on the Rhine river for Montgomery's 21st Army Group. The 17th US Airborne and 6th British Airborne went to battle in the largest air transport force ever assembled. Over 600 C-47s carried paratroopers while others pulled gliders. Complete dedication of tactical air support was guaranteed. On 23 March, two divisions were on the ground within two hours. They quickly secured their objectives as supply drops started. It was a complete success. (2:176-182)

Here we see the cautious employment of airborne forces, considering every factor and all the principles of war that mark Eisenhower's input to this plan. Couple this with veteran airborne commanders who knew how to make the mission work and surprise, mass, and maneuver are evident. Logistical resupply started even before the paratroopers were off the DZ. This operation epitomizes the maturation of both transport crews and paratroopers that will be their hallmarks in the future.

Korean War

One of the shortcomings that affected the efficiency of airborne forces during World War Two was the lack of an

assault airlift aircraft that vehicles could drive on and off, like the glider. To that end, after the war, the US developed the C-82 'Packet' and the C-119 'Flying Boxcar' for use by airborne forces. Both aircraft allowed vehicles to be transported within the fuselage. Airborne forces eagerly developed a variety of techniques for lifting and airdropping a wide range of standard army vehicles and weapons. (2:134) Naturally, this development increased the maneuver ability and firepower of the airborne forces once they were on the ground and increased the logistical sustainment capability by airdropping heavy equipment. Their work would not have a long wait for testing in combat.

When the North Koreans attacked on 25 June 1950 into South Korea, the airborne forces and their new aircraft were ready. On 7 August 1950, a company cut off from its battalion, got aerial resupply on the third attempt. The first fell into enemy hands, the second was a mile short, and finally the third fell on target. (11:272)

The method of resupply that the RAF 31 Squadron and USAAF 2nd TCS had developed in Burma during World War Two were soon put to use. The new C-119 and C-82, supplemented by the C-47 were busy providing, not only logistical airlift, but airdrop resupply. As you can see from the results, the crews needed to refine their art, but they stayed with the mission until the company was resupplied. During the period

of 1 through 5 September 1950 on every day but one, airlift crews airdropped ammunition, food, water and medical supplies to infantry units either cut off, surrounded or unable to withdraw from a salient in the line of battle. (11:452-457) Airlift aircraft and crews had provided a new dimension on the battle field--airdrop sustainment. For most situations, plenty of airlift could be provided by the Far East Air Force Combat Cargo Command (FEAFCCC) commanded by Lt General William H. Tunner. Unlike World War Two, the sky over the battle field was completely owned by FEAF fighter aircraft. Lt General Tunner's FEAFCCC could provide responsive airlift support for the fighting forces on the ground without worrying about enemy fighters. Airlift was truly a combat multiplier. "Battalions, companies, and platoons, cut off and isolated, fought independently of higher control and help except for airdrops which supplied many of them. Airdrops also supplied relief forces trying to reach the front-line units." (11:477)

The airspace over the battlefield was not completely without threat. The enemy soon learned that airlift aircraft were very vulnerable to ground fire; and if any heavy antiaircraft weapons were available, they could easily be shot down. The following example was common. "A stranded Marine company were resupplied by airdrop. Two aircraft

dropped ammunition and medical supplies. Both were hit by enemy fire, one crash landed at Kimpo." (11:534)

On 20 October, General MacArthur directed the 187th Airborne Regiment to airdrop on Sukchon and Sunchon DZs. Transports of the 314th TCS and 21st TCS, 113 total C-119s and C-47s, loaded the paratroopers. After a short weather delay, they delivered the paratroopers to Sukchon DZ as fighters strafed the area. Over 1400 of 1st and 3rd Battalion's men were delivered, with only 25 injured during the drop. One group landed a mile and half east of the DZ and one man was killed by enemy fire in his parachute. Seventy-four tons of equipment were airdropped with the men. Of seven 105mm howitzers, six were usable as was 90 percent of the ammunition. "This was the first time heavy equipment had been dropped in combat, and it was the first time C-119s had been used in a combat parachute operation." (11:579) 2d Battalion jumped into Sunchon DZ with only 20 injuries. Both objectives were achieved by evening. During the next few days approximately 4000 paratroopers and 600 tons of supplies were dropped at Sukchon and Sunchon. General MacArthur commented that the operation seemed to have caught the enemy by complete surprise. (11:577-580)

Basic tactics and employment had not changed since World War Two, but a new dimension had been added. Surprise, maneuver and mass were as important as ever and obviously

achieved during this operation. Remember, General MacArthur had been very successful in the employment of airborne forces in the Pacific during World War Two. The new dimension was the immediate heavy equipment logistical support provided by the new aircraft, the C-119. Seventy-four tons of equipment arrived with the paratroopers by airdrop; gliders were not needed. By the end of the operation, over 600 tons had been airdropped. The real capability of the C-119 is seen in the following account. "On 27 October 1950, ROK forces were cut off and resupplied by ten C-119s with supplies and were able to resume the attack." (11:677) The real operative words in the quote are "...were able to resume the attack." The real test of this recently acquired capability was soon to be tested.

In late November 1950, six Chinese divisions cut off the 1st Marine Division at the Chosin Reservoir along with remnants of the 31st Infantry Division. (12:255) Members of the 21st TCS airdropped 16 tons of supplies using C-47s on 28 November by flying overtime. By noon 29 November, Lt General Edward N. Almond, X Corps Commander, had requested 400 tons of supplies be airdropped to the troops at Chosin Reservoir. The FEAFCCC was only equipped to deliver 70 tons a day by airdrop. The limiting factor in the system was available Army riggers to package and load the airborne supplies for airdrop. By 1 December, the FEAFCCC had geared up to airdrop

250 tons of supplies daily. On 3 December, airdrops were supplying most of the food, ammunition and supplies the encircled troops required. A rocky airstrip was fashioned on 7 December capable of supporting C-47 aircraft. From this make shift runway the 21st TCS flew 273.9 tons of supplies in and 4,689 sick and wounded personnel out of Chosin. Also, on 7 December, eight spans of portable bridging were airdropped to the troops to repair a bridge, allowing the surrounded troops a route for escape with their equipment as Lt General Tunner, Commander, FEAFCCC, had offered on 5 December to air evacuate all the personnel. On 8 December, rescue forces linked up with the 1st Marines at Chosin and ended 13 days of isolation. The FEAFCCC had used 313 C-119s and 37 C-47s to airdrop 1580 tons of supplies and equipment. Some had been damaged and some missed the DZ, but the Marines all felt the airdrops were completely successful. (12:258-259)

The resupply of the Marine Division surrounded at Chosin was the real proof of the Air Force's ability to airdrop the supplies necessary to sustain a large fighting force engaged in combat. Even with heroic efforts by the airlift crews, the airdrop resupply of surrounded forces at Stalingrad and Arnhem had failed in World War Two. This operation provided the proof that when the Army needed airdrop logistical support the Air Force could deliver.

Vietnam to Present Day

These lessons were not wasted on the French who were having problems in Indochina. The insurgents, who were communist backed, were proving a tough group to defeat. The need for airlift in the jungle warfare they were engaged in, was evident. The need became critical in late 1953 when the French decided to create a fortress supplied by air at a place called Dien Bien Phu.

The French requested C-47s and C-119s from the US in the spring of 1953. French crews were operational in the C-119 by fall. On 20 November 1953, two French paratrooper battalions airdropped from French C-47s and seized Dien Bien Phu valley. The second wave followed unopposed. On 25 November, a bulldozer was successfully airdropped on the second attempt by a C-119. Fifteen US C-119s on-loan to the French were to airdrop 1070 tons to Dien Bien Phu, starting on 5 December. The task was completed on 21 December but the requirement continued. By mid-March, 965 sorties had airdropped 5700 tons. The ability to land at Dien Bein Phu airstrip ceased on 27 March 1954 due to enemy artillery fire. The C-119s averaged 23 sorties nightly during mid-April and they, plus C-47s, airdropped over 200 tons on some nights. Drops continued, but the recovery rates decreased. On 7 May,

Dien Bein Phu surrendered. Over 14,800 tons of cargo had been airdropped in 2750 C-119 sorties during the siege. (13:11-21)

The French had created a fortress, but the Vietnamese had cut the lines of communication. With no other means of resupply other than by air, the French had locked themselves into a prison. Poor planning and violation of all the principles of war had cost the French dearly. With no forces able to rescue them, the paratroopers at Dien Bein Phu were doomed. Even the heroic efforts of the French airlift crews could not save them. The lesson learned at Stalingrad by the Germans was retaught to the French at Dien Bein Phu.

The French, however, later proved they had learned their lesson on the employment of airborne forces. Working with the British, on 5 November 1956, French and British parachute battalions airdropped on DZs around Gamil Airfield, Egypt and on the east bank of the Suez canal to secure control of the Suez Canal, held by Egyptian forces. Within ten minutes, 668 British paratroopers were on the ground, rallying and picking up containers of equipment. The British secured the airfield in thirty minutes. The French DZs were smaller and well defended, but they secured their objective, the last surviving bridge across the canal, within an hour of their landing. The operation was a complete success and a

complete surprise. This also marked the first use of troop carrying helicopters to reinforce the paratroopers. (2:189-192)

Complete surprise with maneuver and the logistical support provided by a new element on the airborne battle field, the helicopter, made this operation a success. Superior performance by airlift crews delivered both the British and French forces, on time and on target. The success of the operation speaks for their effective and efficient use of airborne forces.

The US gradually became involved in the Vietnam conflict itself. The South Vietnamese needed help resisting aggression from North Vietnam. On 28 June 1962, a dozen South Vietnamese Air Force (VNAF) C-47s and 16 USAF C-123s performed a combat assault drop of South Vietnamese paratroopers, north of Saigon. The drop was a success, but of no tactical importance and no combat objective as such. Later in the fall, South Vietnamese paratroopers were dropped north of Bien Hoa. The same result was achieved, except five were killed when they stumbled into a mine field. (13:102-103) The capability had been demonstrated, but the South Vietnamese had much to learn about how to perform once they were on the ground. They demonstrated the same mistakes made by other developing airborne forces, failing to use the principles of war. Combined helicopter and airborne assaults

were tried in January 1963, in a surprise pincer sweep to trap enemy forces north of Tay Ninh City. Seventeen USAF C-123s and twenty VNAF C-47s dropped 1250 paratroopers on a DZ. They linked up with helicopter inserted forces in 5 days later. A small tactical success, the drops were good; but the paratroopers refused to leave the DZ until their parachutes were secured and lost much of the element of surprise. (13:128) The mechanics were displayed, but the Vietnamese were still hesitant to employ airborne forces with the intensity necessary to achieve the successes that other airborne units had experienced in the past.

This was the first US use of the helicopter in the assault role in combat. A pattern of operations in South Vietnam was beginning to develop. Rapid deployment of combat forces to the combat zone by airlift or helicopter to surprise and trap the enemy by maneuver became normal operations. The Army developed an infatuation with the ability to maneuver forces around the battle area. It would take time to perfect this movement.

The South Vietnamese continued to employ airborne tactics. The next jump at Ap Bac met resistance on the ground. Of the 320 successfully inserted, 20 were killed and 31 wounded in inconclusive action. (13:129) The war was definitely becoming an airlift operation. As the jungle prohibited maneuver, insertion and resupply by air was the

only answer. During October 1965, USAF C-123s dropped 118 tons during 25 sorties to Pkei Me Camp. (13:213) The lessons learned in the Korean war were starting to pay dividends. Airlift had found a permanent mission in tactical resupply by airdrop.

'JUNCTION CITY' was the code name for the only US parachute assault during the Vietnam war. It consisted of an airdrop of paratroopers followed by resupply by airdrop until an airfield could be constructed. Thirteen C-130's airdropped 780 men of the 2nd Battalion, 173d Parachute Brigade on 22 February 1967. The drop went exactly as planned. The brigade reported 11 injuries, all minor. Ten C-130s airdropped 80 tons of equipment, landed, reloaded and delivered over another 100 tons of equipment the same afternoon. 'JUNCTION CITY' also included the largest helicopter effort to date on the same day. Eight battalions were inserted, delivered by 250 helicopters. Included were the 1st and 3d Battalions of the 173d Parachute Brigade. Airdrops continued on the 23d of February. The plan called for airdropping 1200 tons in the first 7 days, all container delivery system (CDS) drops. Weather at the DZ prevented scheduled mass formation airdrops by 15 C-30s and hampered accurate single ship airdrop delivery. Only 38 airdrops were accomplished the first day with 499 tons delivered. The airdrops continued and improved in accuracy, delivering about

100 tons a day. The airfield was completed on 3 March and the airdrop phase successfully completed. (13:270-278)

The Americans were more successful than their Vietnamese allies. The 'JUNCTION CITY' task force captured enemy supplies and destroyed a large Viet Cong outpost in a pincer movement between the airdrop and helicopter inserted paratroopers. Surprise, maneuver, mass and logistical support were planned and executed in an excellent manner. This was also the combat airdrop debut of a new transport aircraft, the C-130. The new assault transport proved its worth and displayed its proud heritage from the C-47, C-82, C-119, and the C-123. This aircraft would prove to be a welcome addition to the airlift resupply capability as airdrop doctrine took its first significant steps, sustaining the evolving combat mission of the Army in South Vietnam. Maneuver required mobility, mobility required airlift or helicopters for movement and sustainment in the jungle. The lessons of Wingate's operation 'THURSDAY' were being put to good use.

The Army's 'ROVING BRIGADE' tactic relied heavily on airdrop sustainment. The tactic kept a brigade on the move in the field and supplied totally by airdrop and helicopters. The US 196th Brigade received 90 tons of airdropped supplies on the 28th of March. During an eight day period starting 31 March, C-130s airdropped an average of 74 tons daily, all

CDS. The brigade's evaluation of C-130 airdrops were favorable. (13:279-282) The C-130 was a significant step forward in the capability to airdrop supplies as it could carry over 16 tons of supplies rigged for airdrop on one pass. For the entire operation, C-130s airdropped over 1700 tons of supplies and equipment. The in-country, 44-aircraft C-130 logistical shuttle system was not expanded to handle the extra load. (13:282) Nonetheless, the airlifters maintained continuous logistics support and provided the supplies to make the 'ROVING BRIGADE' tactic a success.

In April 1967, the Marines occupied the hill positions at Khe Sanh and reopened the highway to the coast as a supply route. Frequent cuts on the road and attacks on supply convoys by the enemy led to the command decision to resupply the Marine garrison at Khe Sanh totally by air. The airstrip at Keh Sanh eroded badly during the summer rains, so Marine KC-130s commenced daily airdrops of food, fuel and munitions. Air Force C-130s were tasked to deliver construction materials for rebuilding the airstrip. (13:290-294) The method of delivery was new and called the low altitude parachute extraction system (LAPES). The new system allowed heavier loads of much needed ammunition to be delivered by airdrop. Runway construction materials required even heavier loads to be delivered if the runway was going to be repaired as promised. The old ground proximity extraction

system (GPES), previously used and discarded for the newly developed LAPES, was revived and used to quickly deliver loads even too heavy for LAPES.

On September 6, USAF airdrops and extractions started. Each day, three AF C-130s airdropped CDS bundles and two flew LAPES or GPES deliveries. The force at Khe Sanh was totally dependent on airdrop resupply throughout the fall. On 15 October, an AF C-130 crashed in bad weather as it attempted to deliver a load of CDS bundles in marginal weather and was hit by ground fire. (13:290-294)

During the early months of 1968, 15 C-130 sorties provided the 185 ton daily needs of the garrison. On 21 January 1968, enemy artillery fire destroyed the ammunition bunker and 1400 tons of munitions. The Marines immediately requested "emergency" airdrop resupply. Six C-123s were diverted and landed with difficulty on the badly eroded airstrip. C-130s resumed landings on 23 January after emergency repair of the landing zone with the construction materials previously delivered by GPES. Enemy fire and bad weather were factors during this time, but C-130s averaged 250 tons daily for 8 days. During January, C-123s and C-130s hauled over 3600 tons into the garrison. (13:299) Khe Sanh was developing into a resupply effort of heroic proportions. Modern airlift was getting its test by fire.

The same effort continued in February, but enemy antiaircraft fire increased and mortar shelling started while aircraft were off-loading, producing some battle damaged aircraft. On February 10, a Marine KC-130 carrying fuel bladders was hit on final approach, caught fire and burnt after landing, killing two crewmembers and four passengers. (13:300) With this loss rate on the ground, airdrop resupply was becoming even more economically feasible. On 4 February, ground radar aerial delivery system (GRADS) airdrops were practiced in good weather and provided satisfactory accuracy and reliability. (13:301) On 12 February, C-130 landings stopped at Khe Sanh and C-123 landings increased. The daily supply requirement was 235 tons (18 tons for day to day consumption and the rest for stock build up). (13:303) Blind C-130 CDS airdrops started on 13 February. Although both sorties could visually identify the DZ from the air, they used GRADS to successfully deliver the CDS bundles. Over the next two days, 12 more successful airdrops were made. LAPES deliveries also occurred as weather permitted. On 16 February, a bad weather day, 169 tons arrived by various methods. Weather forced GRADS CDS airdrops for the next few days. Fifteen C-130s landed during the last four days in February, but damage inflicted by enemy fire stopped all C-130 landings for the remainder of the siege. (13:303-304) The price of resuppling Khe Sanh was going up

and went higher when three C-123s were lost in March while landing at Khe Sanh. (13:307) Airdrop resupply was again becoming the only method of keeping the Marines supplied with the ammunition, food and medical supplies needed to keep them from being over run.

Early in March, airdrop accuracy took a nose dive. A combination of radar error and crew problems were quickly corrected. "...During the siege the C-130 had an average circular error of 95 yards when airdropping visually and 133 yards when using the blind technique. The C-123s averaged 70 yards. Of the more than six hundred container airdrops, all but three loads were recovered. The rate of damage was ten percent for ammunition and five percent for rations." (13:312) "For the full month of March, Air Force transports delivered over 5100 tons." (13:313) Airdrop sustainment had come of age.

Highway 9 to Khe Sanh was reopened by ground units on 11 March and the resupply officially ended with the last airdrops on 8 April. (13:314) Airlift crews learned several lessons at Khe Sanh. The first is never discard an air delivery system. The quick use of an obsolete system, GPES, provided a resupply method for heavy loads that enabled the runway to be rebuilt. Second, ground radar could be used to position aircraft over the DZ in bad weather, giving airlifters an all-weather airdrop capability they badly

needed. The third was airlift aircraft are very vulnerable to even enemy small arms fire. The enemy's failure to escalate antiaircraft defenses to SA-7 or 37mm and 57mm fire was surprising. Indications were that an increased threat was imminent had the siege continued. On 1 April, a Marine reported an SA-7 firing just 7 miles northwest of Khe Sanh. Even without heavy anti-aircraft weapons, three C-123s were destroyed by enemy fire and 18 C-130s and 8 C-123s received battle damage. (13:316)

"Khe Sanh resupply, January 21 through April 8, 1968:"(13:315)

		Sorties	Total tons
C-130 Airdrops	CDS	496	
	LAPES	52	7826
	GPES	15	
C-123 Airdrops		105	294
(Totals)		(768)	(8120)

Figure 2-1

In the final estimate, a quote about the airlift effort at Khe Sanh says it all: "Airlift made possible the allied victory of Khe Sanh in 1968. The campaign bore comparison with the classic combat airlifts of Stalingrad, Burma and Dien Bien Phu." (13:295)

Khe Sanh was not the only garrison requiring airdrop resupply as the 1968 Tet offensive gained momentum. Air Force C-130s delivered 350 tons of supplies to Camp Evans in [illegible] sorties during 4-7 February. (13:325) This became a standard operation for the airlift crews operating in South Vietnam during the 1968 Tet offensive. Two factors had a

direct impact on the airdrop requirement. First, the intense and fluid nature of the battlefield increased consumption rates for Army units. Second, the remote areas where US forces selected to engage the enemy in battle created many situations like the one at A Luoi.

A Luoi was a garrison far up the A Shau valley. After the success at Khe Sanh, General Westmoreland realized that airdrop resupply would allow forces to move farther into the A Shau valley on missions to strike enemy strongholds previously unsupportable logistically. (13:326) On 26 April 1968, 12 C-130s were scheduled to make CDS airdrops to resupply the garrison at A Luoi. The first crew had to make a blind let down through the weather to 500 feet AGL inside the A Shau valley. They acquired the DZ and completed a successful airdrop as did the number two aircraft. Aircraft three and four had to circle in the valley to align and took some small arms fire, but also airdropped successfully. By noon, all 12 aircraft had completed their morning airdrops and reloaded for the afternoon sorties. A total of 20 sorties, delivering 270 tons had been flown, with seven aircraft receiving battle damage. On sortie number 21, accurate enemy fire increased, forcing the C-130 to crash land. All six crewmembers were killed. (13:335-336) Marginal weather continued to plague the operation on 27 April. Only fifteen C-130 airdrops were completed. The

airdrop sorties accuracy averaged under 100 yards from the aim point. (13:337) On 29 April, 22 successful airdrops were completed, but at a price. One C-130 was badly damaged by ground fire but managed to limp back to Da Nang. (13:338) On 30 April, C-130s completed 27 airdrops, the highest single day effort. The last airdrop occurred on 4 May, the day the first C-130 landed at A Luoi's newly constructed airstrip. Airdrop sustainment was a major factor in the tactical success of the operation at A Luoi.

"In nine days the C-130s in 165 airdrops released 2300 tons of cargo..." "All but one percent of the tonnage airdropped was recovered with negligible damage." One C-130 was destroyed and four received major battle damage. (13:339) The demand for airdrop resupply was being met by the airlift crews. Weather and enemy ground fire were the two biggest obstacles that the aircrews faced. Aircrew dedication and a 'can-do' attitude resulted in the success of operations like A Luoi.

After the 1968 Tet offensive, airdrop requirements declined significantly. Airdrop sorties had decreased to about 10 sorties per month by early 1970. This was followed by a similar reduction in the number of airdrop qualified aircrews and the number of airdrop riggers. (13:497) Although the loss of aircraft and battle damage had increased during the intense combat of the 1968 Tet offensive, little

was being done to counter the increasing threat; but airlift forces were working to solve the weather problem.

First used at Khe Sanh to defeat bad weather, GRADS airdrops were being refined during this time. Thirty-three test airdrops were highly successful. (13:484-485) Perfection of this system allowed airlift crews to provide the continuous resupply of any garrison under radar coverage, without regard to the weather. In addition, the adverse weather aerial delivery system (AWADS) training had started in the continental United States (CONUS) and by June 1971, the testing was complete and successful. (13:485) New, AWADS allowed the aircrew to use an improved on-board C-130 radar coupled to a new computer, to make accurate airdrops in bad weather. Things were quiet for the moment, but the training would be put to good use later at An Loc.

Surrounded by the initial North Vietnamese attacks during the Easter offensive in 1972, An Loc had a garrison of 20,000 South Vietnamese troops and American advisors. The resupply objective was 200 tons daily. VNAF Chinooks halted helicopter resupply on 12 April 1972 due to ground fire and airdrops commenced. First, the Vietnamese tried to use VNAF C-123s and C-119s. In the first three days, only 34 tons of 135 tons airdropped had been recovered. Six aircraft had been hit by ground fire and two VNAF C-123s were lost to ground fire on 15 April, which ended the VNAF airdrop

attempts. Only 190 tons had been airdropped in 39 sorties. Something else would have to be done. (13:539-541)

On 14 April, three USAF C-130 crews briefed and selected the soccer field as the DZ for CDS airdrops. Using standard low level airdrop tactics, the first C-130 across the DZ was hit in the tail by ground fire. The second C-130 received barrage fire directly over the DZ. The flight engineer was killed, the navigator and copilot wounded. The aircraft limped back to Tan Son Nhut and recovered. The third aircraft aborted the mission due to the ground fire.

Tactics had to be change High speed, low level run-ins, pop-up, release, and d ving escapes were planned using six different run in courses. On 16 April, two aircraft airdropped and were hit by ground fire, but with only minor damage. Both crews reported accurate airdrops and positively identified the DZ. Ground reports said all bundles were unrecoverable. The DZ had been misplotted and was actually east instead of west of the major road into An Loc.

No missions were attempted on the 17th, but on the 18th, one crew took severe fire over the DZ and had to crash land nearby. By 19 April, three transports had been lost in daylight resupply airdrops to An Loc. (13:542-543)

There had to be a complete change of conventional tactics. High altitude GRADS was tried next on the night of

19/20 April. Previously used to deliver BLU-82 bombs and used low altitude for airdrop at Khe Sanh in 1968, the system only put 2 of 26 tons on the DZ from 8000 feet AGL. Six more airdrops sorties during the next four days used the same method, day and night. The recoverable load percentage remained poor. (13:544) The GRADS worked, but CDS bundle airdrop ballistics from 8000 feet AGL, above the ground threat, couldn't be predicted.

On the night of 23/24 April, CDS deliveries were tried using visual, low level, night airdrop techniques. During these two nights, 120 of 170 tons were reported recoverable. On the third night, the fourth C-130 to airdrop entered barrage fire and crashed a mile from the DZ. The crash, coupled with bad weather, caused the next ten missions to be cancelled. Two aircraft made daylight, low level, airdrops on 27 April; most of the bundles were recovered but both aircraft took heavy battle damage. On the next 7 nights, they flew 37 low level sorties to An Loc: 35 tons were recovered, 96 tons possibly recovered, 350 tons lost. More than half of the C-130s took hits. The night of 3/4 May, a third C-130 and six crewmembers were lost. Night low level airdrops were terminated. (13:545-546) An Loc was quickly turning into a Dien Bien Phu for the US.

On 4 May, high altitude/low opening (HALO) CDS bundles, using GRADS releases from high altitude, were

attempted. Of the two C-130 HALO CDS loads airdropped, all but one bundle was recovered. On 5 May, 11 C-130s used HALO CDS bundles airdropped by GRADS. Some bundles were damaged when the parachutes failed to open completely, but most of the supplies were usable. Of 88 bundles, 73 landed on the DZ. Twenty-one HALO CDS airdrops over the next two days had similar results. Over a 4 day period, 185 one ton HALO CDS bundles were recovered. By 10 May, the incidence of parachutes failing to open had decreased to a very small percentage. The report of SA-7 firings near An Loc made any future low level CDS airdrops impossible. Newer, more accurate, high velocity chutes were introduced and during 8-10 May period, 139 of 140 bundles landed on the DZ. The number of sorties began to decrease as accuracy of the HALO CDS airdrops increased. (13:548-551) Sufficient airdrop resupply of An Loc was assured.

A summary of An Loc C-130 airdrop resupply:

	Sorties			
	Low Alt	High Alt	Tons A/D	Recovered
15 Apr-4 May	57	8	845	278
4-14 May		82	622	515
15-27 May		58	922	898
26 May-30 Jun		98	1568	1440
Jul-Sep		190	2790	2690
Oct-Dec		143	2000	1850
<u>South DZs</u>				
22 May-Jun 30		56	896	
Jul-Aug		12	168	

Total C-130 airdrop resupply effort 15 April to 30 June: 359 sorties, 4853 tons airdropped. (13:555)

Figure 2-2

The threat problems that affected the resupply of Khe Sanh in 1968 had not been resolved in the interim period prior to An Loc in 1972. In the end, the system that initially set out to solve the weather problem, also became the one that solved the An Loc problem of intense ground fire. A doctrine that had evolved during World War Two and through the Korean war led the airlifters to think [illegible] keep the Army supplied in any ground threat situation where the US had air superiority. An increase in the lethality of small, ground air defense weapons proved that further evolution of doctrine was required. The resupply of An Loc changed the direction of all future resupply efforts. New, sophisticated systems were being developed to increase accuracy and survivability of airdrop forces.

During 1972, the need for HALO CDS airdrop resupply rapidly escalated. The C-130s flew 52 sorties in April, 264 in May, 282 in June, for a total of 598 sorties. (13:574) Ben Het, Dak Pek, and Mang Buk received 31 airdrops in May and June 1972 using GRADS, delivering over 465 tons. At Kontum, 116 airdrop sorties using the same methods were effective. Of note, 16 of the airdrops at Kontum were made using AWADS. (13:570) The first AWADS combat airdrop occurred on 1 June 1972 at Svay Rieng, Cambodia and was successful. On 12 June, station keeping equipment (SKE) was used for a two ship formation HALO CDS airdrop, guided by

AWADS. By 30 June, 387 airdrop sorties had been flown by the 61 TAS an AWADS equipped unit, of which 70 were AWADS, 3 SKE, and 314 GRADS. (13:572)

Even as the cease fire went into effect in January of 1973, the need for high altitude airdrops continued. "Airdrops remained the exclusive responsibility of AWADS ships and crews from TAC, now called Easter Bunny force." (13:606) C-130s flew 507 airdrop sorties from July through December 1973 and 1369 from January through September 1974. (13:680) During July 1974, 1716 tons were airdropped in Cambodia. (13:626) The war had moved into Cambodia and the new tactics and new systems were employed and proven. Airdrop was entering a new age.

Historic aspects of Vietnam airlift as compared to other previous airlift efforts

<u>In millions of tons</u>:	
USAF Transports in Vietnam, 1962-1972	7
China, Burma, India theater World War Two	1.75
Berlin Airlift	1.75
Korean War airlift	.74
<u>In tons per day</u>:	
USAF in Vietnam, 1968	4000
Peak effort in Western Europe Sept 5-14, 1944	1700
Peak effort in China July 1945	2200
Peak Allied effort to Berlin in spring 1949	8000
Deliveries to Korea, November 1950	1050

(13:691)

Figure 2-3

Without a long explanation, airdrop resupply techniques and the airlift crews had matured during the conflict in Vietnam. They had graduated from the tactics of

World War Two where the Army walked and rode into battle on wheeled vehicles to the point where helicopters whisked the Army units to remote locations to engage the enemy. Sustainment of these units at remote locations, usually without landing zones, resulted in an increase in the need for airdrop resupply. It seemed that a lot had changed in the world and new methods of delivery and resupply would be needed to keep up with the Army of the future. Training continued, and fortunately, good leadership held the course for airlift forces. Another test would come to insure airlifters could do their basic mission--deliver paratroopers into combat by airdrop.

The challenge came slightly less than ten years from the last combat airdrops in Cambodia in operation 'URGENT FURY'. The 1st Battalion of the 75th Rangers jumped from C-130 aircraft at 0530, 23 October 1983, 30 minutes late from the planned time over the target on Port Salinas, Grenada. The Rangers were selected for their ability to secure the airfield and the airlanded 82nd Airborne paratroopers for their firepower. Due to the threat and to reduce time under the canopy, the commander of the Rangers ordered the jump to be conducted at 500 feet AGL instead of the usual 1100 feet. Only one Ranger was injured due to jump related injuries. The first jumper was away at 0530, the runway was cleared at 0630 and the airfield secure at 0715. The university campus

with American students to be rescued was secured at 0850. The first C-141 landed at Port Salinas at 1405 with the first elements of the 82nd Airborne Division. (17:99-103) Ten C-130 aircraft airdropped 500 U.S. Army Rangers in an operation that ended after 18 servicemen had died in combat and 116 were wounded. (14:2)

This operation proceeded better than any in the past, just as it should. The commanders of both Army and airlift forces had learned lessons and put the principles of war to use. Surprise, maneuver, mass and good logistical support continued to insure success in this airborne operation. But even with the success, there was a lesson. The ZSU 23-4 antiaircraft weapons on the ridge above the Port Salinas DZ had forced two C-130s to abort their first run-in for airdrop until suppressive fire could silence the guns. Very lethal antiaircraft weapons are available to any third world nation. The lesson: the threat level will be high anywhere in the world in the future.

Summary

The distance and time between 'URGENT FURY' in October 1983 and the German 'WESERBUNG' paradrop in April 1940 and is filled with threads of airlift doctrine. Some of the doctrinal threads evolve, such as factors such as technology, and continue to impact on airlift. Even as some threads change, the changes follow a pattern, while other

threads remain basic and central. As such, they create doctrinal foundation for the employment of our airdrop forces. In the summary, we will look for the patterns of change and the basics in airlift airdrop doctrine.

First, the one thread of doctrine that has been constant, is centralized control and decentralized execution. From the lessons of World War Two for all of airpower to Vietnam where airlift was the focus, this doctrinal principle remained firm and basic. (6:3, 13:126-127)

Second is the fact our doctrine drives the way that we train. "The Air Force has a primary function to train combat and support forces to ensure the conduct of prompt and sustained aerospace combat...the goal of producing a credible, cohesive warfighting team." (1:4-6) Airlift forces are no different and must insure sufficient training to accomplish our combat missions as defined by AFM 1-1. The poor performance of the USAAF transport crews early in World War Two are an indication that the doctrine to guide the training of airlift crews was not present at that time. (6:3) As the doctrine developed and the missions were better defined, crews trained to meet doctrinal standards and their performance improved. (2:184) By the Korean War, specific aircraft were developed to conduct a mission defined by doctrine. The need for the ability to airdrop heavy equipment to support airborne forces resulted in the C-119.

an aircraft that performed its role well in the Korean War and at Dien Bien Phu. The new mission resulted in training aircrews in new delivery techniques. By the Vietnam conflict, the aircrews were performing resupply effectively, with a wide variety of delivery methods. There is one thing about airdrop training unique from most other Air Force missions; one half of our "credible, cohesive warfighting team" is the Army. The need for training includes joint Army/Air Force training. History definitely shows this thread of doctrine has a very positive effect on the success of any airborne or airdrop operation. (6:7)

Third, the principles of war insuring success in any airborne operation have remained constant: surprise, maneuver, mass and logistics. (2:160) From these, the airlift force can draw some valuable doctrinal lessons. First, operations security is mandatory to achieve the surprise needed for success. This applies to the airborne forces and the airlift element. Without guaranteed secrecy of objective, the operation should be cancelled. Second, airlift will continue to provide the element of maneuver for most airborne insertions. Once in place on the objective, the airborne forces require link-up with ground forces or immediate airdrop resupply to sustain them, which airlift normally supplies. (2:107) Third, airlift forces are responsible to insure that the airborne force arrives on the

objective in mass. Paratroopers landing far from the objective area are of little help applying combat power against the enemy. An airborne force is a very fragile combat unit, and lack of mass at the critical time can mean loss of the entire combat force. (9:9) Finally, airlift is logistics. Airlift will take most airborne units to battle. When isolated, any unit needs sustainment; airlift responds. (12:258-259) If threat, weather, or lack of capability prevents an adequate sustainment response, the results are usually disastrous. (4:280, 13:21) The principles of war are constant; basic doctrine threads throughout history.

At the operational doctrine level, logistical sustainment is the basic and primary mission. (15:3) For the purposes of this paper, we are looking at sustainment by airdrop. often the only means of delivering supplies to some units. The factors that must be considered at this level are weather, threat and the need for adequate airlift resources. (15:3) These three factors have been gleaned from the lessons learned in history.

One of natures variables has always contributed to the fog and friction of war--weather. No matter how critical the need for logistical sustainment, weather can significantly degrade any effort. During the early days of airlift, the capability to conduct airdrop operations was directly tied to the visibility in the objective area.

(13:274, 2:125) Technology progressed until in Vietnam at Khe Sanh, ground based radar provided positioning for resupply airdrops with acceptable accuracy. In fact, at Khe Sanh the weather actually provided some cover from the accurate enemy ground fire. (13:303) At An Loc, weather coupled with threat, again, drove resupply airdrops to use radar for ground positioning. The evolution has reached the point of being able to insert paratroopers and supplies with acceptable accuracy using on-board systems, without visual contact with the ground. Both authors have participated in simulated combat airdrop deliveries of men and equipment flying in instrument meterological conditions (IMC) from takeoff to landing. We have overcome the weather to a point where we can support our mission almost without regard to cloud cover; but in the mean time, threat has evolved to almost take this capability away from us. (16:16)

The threat has increased during every conflict, police action, limited war and operation in which airdrop resupply has ever been employed. The men at Stalingrad and Dien Bien Phu can tell you the importance of keeping the air lines of communication open. Ground defenses caused the ultimate collapse of both garrisons. (4:280, 13:21) Artillery fire drove both operations from an airhead operation to an airdrop resupply operation, which is inherently much less efficient. With no control of the air

and suppression of antiaircraft weapons, the Luftwaffe was terribly hampered at Stalingrad. Although the French at Dien Bien Phu had control of the air, they could not maintain their perimeter defenses. Without supplies it is hard to project any combat power.

The threat continued to evolve, until at An Loc, airlift had to change its operational doctrine to provide airdrop sustainment for that garrison. (13:545-546) The lethality of the threat has increased to a point were unless airlift operational doctrine continues to evolve at the same rate, it can seriously hamper the success of any airborne operation, insertion or sustainment. Unlike Khe Sanh, where weather provided a concealment from threat, the threat has the capability, down to battalion level, to destroy one airlift aircraft for every antiaircraft weapon fired. (16:15) History points out, if our doctrine is to support any airdrop mission in any threat environment, we will rapidly deplete theater airlift forces to a point they will be completely ineffective.

Airlift has become increasingly more important in achieving success on the battlefield throughout history. World War Two only started to touch on the critical importance of adequate airlift to carry out the airdrop logistics mission. There were first some notable failure The battle at Stalingrad, where the Luftwaffe's airlift

capability was seriously overestimated, caused the loss of the German 6th Army and the loss of momentum on the Eastern front. (4:280) The 1st British Airborne Corps' parachute assault on the bridge at Arnhem was limited to 35 percent of their combat power on the first day due to the lack of airlift resources. (9:9) On the other hand, Wingate's use of the 10th Air Commando's transports in Burma to support the 14th Army in the field was carried off successfully because he had a fleet of transports larger than any of the world's battle fronts. (7:7) During the entire Korean War, the requests for airdrop resupply continued to climb. In fact in one day, the requests went from airdropping about 20 tons per day to requests for over 400 tons to be airdropped the next day at the Chosin Reservoir. (12:258) The loss of Dien Bien Phu indicated the need for an increased capability to deliver large amounts of supplies by airdrop. Lack of sufficient airdrop resources alone, did not cause the loss, but it sealed the fate of the French garrison.

Clearly, in recent history, airlift has provided the critical combat power or supplies to the precise point of use in almost every situation. The Vietnam conflict is a monument to the use of airlift to multiply combat power. A simple look at the increase in tons of supplies airdropped in Figure 2-3 proves the point. (13:691) History makes this

thread of doctrine crystal clear--the sufficiency of theater airlift forces contributes directly to the successful outcome of battles and wars.

AIRBORNE OPERATIONS--WORLD WAR TWO

Date-Operation Country	Number of Troops Airdropped	Sufficient Airlift Forces	Joint Training	Resupply/Linkup Suprise	No. of Objectives Percent Success	Total Mission Success
Apr 1940-WESERBUNG, Scand. German Airborne	2 Battalions	no	yes	partially yes	50%	Lost Norse objectives Danish portion success
May 1940-FALL GELB, Nethrlnd German Airborne	3 Battalions	no	yes	Less than a third yes	33%	Complete failure, as could not hold airhead
May 1940-Eben Emael, Nethrlnd German Airborne	2 Battalions	yes	yes	yes yes	66%	All 3 bridges captured one destroyed by enemy
Feb 1941-COLOSSUS, Italy British Airborne	1 Company plus	yes	yes	no yes	none	Failed to destroy the target, all captured
May 1941-MEKUR, Crete German Airborne	4 Battalions	yes	yes	partial and late yes	100%	Successful, but was at a heavy price.
Jan 1942-Luga, Russia Soviet Airborne	5 Battalions	yes	unknown	no yes	50%	Airborne troops failed to develop an attack
Feb 1942-BITING, Europe British Airborne	1 Company	yes	yes	yes yes	100%	Destroyed radar and departed smoothly
Feb 1942-Palembang, Pacific Japanese Airborne	130	yes	unknown	yes yes	100%	Complete surprise, all of refinery captured
Sept 1942-North Africa US 503d Parachute Regiment	1 Battalion	yes	no	yes yes	none	No airdrop, forced to land at wrong DZ
Nov 1942-North Africa British Airborne	1 Battalion	yes	no	no yes	none	No link-up, had to retreat to own lines
Jul 1943-LADBROOKE, Sicily US 505th Parachute Regiment	3 Battalions	yes	no	yes yes	100%	Invasion a success, but airborne failed
Jul 1943-Farello, Sicily US 504th Parachute Rgt Plus	4 Battalions	yes, but 60 of 144 aircraft lost en route	no	yes yes	none	Over 70% of unit des- troyed by US forces
Jul 1943-Primasole, Sicily 1st British Brigade	3 Battalions	yes, but 38 of 100+ aircraft did not drop	yes	yes yes	100%	Held the bridge but at a very high price
Sep 1943-Dnieper Lnoc, Russia Soviet Airborne	3 Battalions	no, the whole airlift force was inadequate	unknown	no no	none	Entire airborne force eliminated by Germans

Figure 2-4

AIRBORNE OPERATIONS--WORLD WAR TWO cont.

Date-Operation Country	Number of Troops Airdropped	Sufficient Airlift Forces	Joint Training	Resupply/Linkup Suprise	No. of Objectives Percent Success	Total Mission Success
Sep 1943-Nadzab, Pacific US 503rd Parachute Regiment	3 Battalions	yes	yes	yes yes	100%	Captured airfield, but hampered by poor intel
Jun 1944-OVERLORD, Europe British Airborne Corps	Division plus	yes	yes	yes yes	100%	Held the flanks of the invasion
Jun 1944-OVERLORD, Europe US Airborne Corps	2 Divisions Plus	yes, but many of the troops & equip off DZ	yes	yes yes	100%	Held the flanks, hard to form cohesive units
Jul 1944-Noemfor, Pacific US 503rd Parachute Regiment	2 Battalions	yes, but very poor drop tactics	no	yes yes	100%	Msn success, but air-drop was poorly done
Aug 1944-RUGBY Allied Airborne	6 Battalions	yes, but fog obscured the DZs for the drops	yes	yes no	100%	Poor drops, but the mission was a success
Sep 1944-MARKET, Europe Allied Airborne Army	Airborne Army	no, not all units on DZ on the first day	yes	not complete yes/no	75%	Failed when the bridge at Arnhem was lost
Dec 1944-Leyete, Pacific Japanese Airborne	1 Battalion	yes, but 10% of the aircraft lost to AAA	unknown	no yes	none	Entire force captured by the US paratroopers
Dec 1944-Battle of the Bulge German	2 Battalions	yes, but only 10 of 105 reached the DZs	no	no yes	none	Failed completely, last German operation
Feb 1945-Tagaytay, Pacific 11th Airborne Division	3 Battalions	no, only 50% of the requiried available	yes	yes yes	100%	Msn success after over 50% of force missed DZ
Feb 1945-Corregidor, Pacific US 503rd Parachute Regiment	2 Battalions	yes	yes	yes yes	100%	Injuries on DZ large due to winds, msn OK
Mar 1945-VARSITY, Europe Allied Airborne Corps	2 Divisions	yes	yes	yes yes	100%	Complete success
Mar 1945-Los Banos, Pacific US Airborne	1 Company	yes	yes	yes yes	100%	One company overcame all of POW camp guards

Figure 2-5

AIRBORNE OPERATIONS--KOREAN WAR TO PRESENT

Date-Operation Country	Number of Troops Airdropped	Sufficient Airlift Forces	Joint Training	Resupply/Linkup Suprise	No. of Objectives Percent Success	Total Mission Success
Oct 1950-Sukchon, Korea 183rd Parachute Regiment	4000	yes	yes	yes yes	75%	Airdrop a success, but didn't cut off enemy
Nov 1953-Dein Bein Phu, VN French Paratroopers	approx. 3600	yes	yes	partially no	100%	Garrison lost, unable support by airdrop.
Nov 1956-Gamil Airfield Egypt French and British	2 Battalions	yes	yes	yes yes	100%	Complete control of airfield and bridges
Jan 1963-Tay Ninh City, VN Vietnamese Paratroopers	1250	yes	yes	yes questioned	100%	>10% as slow movement off DZ lost surprise
Jan 1963-Ap Bac, VN Vietnamese Paratroopers	320	yes	yes	yes questioned	>25%	They lost over 10% of unit on the DZ
Feb 1967-JUNCTION CITY DZ, VN 173rd Parachute Regiment	780	yes	yes	yes yes	100%	They completed link-up with helicopter forces
Oct 1983-Grenada 1st/75th Rangers	500	yes	yes	yes partial	100%	Complete success, all students rescued

Figure 2-6

SUSTAINMENT RESUPPLY EFFORTS

Date-Operation Country	Tons Airdropped Required	Tons Recovered Delivered	Airdrop Method/s	Type Aircraft	Aircraft Losses	Mission success
Oct-Dec 1942, Stalingrad Russia	500 tons per day minimum	100 tons per day averaged	Bundle	Ju52	High, but unkown	Failed to save German 6th Army
Jun-Dec 1944, THURSDAY Burma	2000 tons per day	2000 tons per day	Bundle	C-47, C-46	Low, but unknown	14th Army survived in field engaged
Sep 1944, MARKET Arnhem	unknown	very small percent	Bundle	C-47	High, but unknown	Failed to save 1st British Corps
Dec 1944, Battle of the Bulge Bastogne	unknown	1000 tons for seige	Bundle	C-47	unknown	Saved the 101st Airborne until relief
Nov-Dec 1950, Chosin Korea	400 tons per day	250 tons per day	Bundle and Equip	C-119, C-47	2 C-47s	Succeeded till relief forces arrived
Mar-May 1953, Dein Bein Phu Vietnam	unkown	14,800 tons airdropped and recovered	Bundle and Equip	C-119, C-47	unknown	Enemy increased force denied resupply effort
Mar 1967, Roving Brigade Vietnam	unknown	1700 tons during the operation	CDS	C-130	unknown	'Roving Brigade' was a success
Jan-Mar 1968, Khe Sanh Vietnam	up to 250 tons per day	150 tons per day averaged	CDS, LAPES GPES	C-123, C-130	3 C-123s 2 C-130s	Succeeded till relief forces arrived
Apr 1968, A Luoi Vietnam	unknown	2300 tons airdropped in 9 days	CDS	C-130	1 C-130	A Luoi forces stayed engaged in combat
Apr-Jun 1972, An Loc Vietnam	200 tons per day required	4853 tons airdropped during this period	CDS, and HALO CDS	C-130	3 C-130s	An Loc survived, first drops bad but improved

Figure 2-7

CHAPTER III

ARMY AND AIR FORCE DOCTRINE--THE AIRLAND BATTLE

Introduction

Both the Army and the Air Force have developed a statement of doctrine, but they have approached the subject in substantially different ways. The Army's concept of doctrine, "...is the condensed expression of its approach to fighting campaigns, major operations, battles and engagements." (1:6) Simply stated, it describes how the Army intends to win wars.

The Air Force looks at doctrine more philosphically. Air Force basic doctrine, expressed in AFM 1-1, "...states the most fundamental and enduring beliefs which describe and guide the proper use of aerospace forces in military action." (2:V) Even this more general definition, however, belies the difference between Army and Air Force doctrine. Whereas Army doctrine emphasizes the practical question of how to fight a war, Air Force doctrine emphasizes the more general characteristics, capabilities and missions of airpower. Despite the differences in approaches, the authors will attempt to characterize the essence of each service's doctrine and analyze them for consistency.

Although both Air Force and Army doctrine applies in varying degrees to all levels of warfare in any geographical

region, their precepts are most consistent with high intensity conflict, such as might be found in the central NATO region in a conflict with the Warsaw Pact. In other levels of conflict or regions of the world, the doctrinal statements would require considerable tailoring and modification. Consequently, this report will focus on war in central Europe and analyze Army and Air Force doctrine from that vantage point.

The Army expects the battlefield in Europe to be immense, stretching across a wider expanse of land than in previous wars. (1:2) In this battlefield environment and with a substantial numerical superiority, the enemy will probably attack along a broad front and attempt to break through at various points. (3:1) Warsaw Pact forces will attempt to achieve their objectives through coordinated echeloned attacks. Using massed blitzkrieg style attacks, the first echelon will attempt to pierce the NATO ranks and create an opening that can be exploited by second and succeeding echelon forces, probably consisting of armored forces and operational maneuver groups. These second echelon forces will then rush to the rear areas in an attempt to crush NATO's defenses. (4:115) Warsaw Pact attacks can be characterized by speed, initiative, mass and numerical superiority. In brief terms, this is the most likely

environment for employment of current Air Force and Army doctrine, as envisioned by the doctrines themselves.

Army Doctrine-The AirLand Battle

The Army's official doctrine, entitled AirLand Battle, is developed and explained in FM 100-5. The purpose of this doctrine, as explained by General Vuono, Army Chief of Staff, is to put superior forces on the battlefield at the decisive place and time. (5:9) The AirLand Battle depends on attacking the critical link in the enemy's formation with maximum strength in the shortest possible time. (6:120)

The AirLand Battle, with its emphasis on maneuver and deep attack, reflects a significant change in Army thinking. Earlier doctrine of the 1960's and 1970's relied on defense and attrition to defeat a Warsaw Pact attack. This "active defense" concept virtually ignored maneuver and relied on a sequence of attack and disengagement, thereby slowly sucking the enemy deeper into NATO territory and denying him a decisive engagement. (7:36) Recognizing the risk posed by echeloned Soviet forces to forward deployed allied forces, Army thinking changed in the late 1970's. The final result was the new Army Field Manual 100-5 in 1982, which codified the AirLand Battle as official Army doctrine.

According to AirLand Battle doctrine, the numerically superior enemy can only be defeated by aggressive use of maneuver. To be effective, allied attacks must be rapid,

unpredictable and violent, while attempting to attain the advantage by applying maximum offensive pressure against the weakest point of the enemy formation. (1:14) A blitzkrieg style attack is envisioned where allied forces seize the initiative from the aggressors. Surprise, concentration, agility and speed are all essential ingredients for success. (1:15)

World War Two's largest airborne operation, MARKET GARDEN, was a failure largely because the airdrops were spread over three days. As a result, the elements of surprise and mass were lost. If more theater airlift aircraft had been available, the Allies could have taken advantage of these elements, and the outcome of the battle may have been substantially different. (18:25) Field Manual 100-5 identifies a series of AirLand Battle imperatives that are absolutely necessary for success in battle. Among these basic tenets are concentration of combat power, rapid movement, and deceptive use of terrain and weather. (1:23)

Discerning the enemy's vulnerabilities and concentrating combat power at this weak point are fundamental to seizing and maintaining the initiative, particularly when the enemy has superior numbers. Although it may be no small task to identify enemy vulnerabilities, rapid reorientation of forces and concentration at the critical point is

frequently the most complex task. The requirement for a responsive mobility capability is apparent.

Similarly, the AirLand Battle recognizes rapid movement as one of its imperatives. Speed, always an essential ingredient in combat, is even more critical today because of improved firepower and sensor technology. (2:24) Troops must have the ability to rapidly change positions and move quickly in and out of an area of operations. Again, mobility techniques are paramount.

The final AirLand imperative to be discussed here is the use of terrain, weather and deception. Adverse terrain and inclement weather can be a combatant's worst enemy or best ally. Used correctly, these components of nature can be effectively exploited by an enterprising ground commander to deceive and surprise the enemy. But to optimize the tactical advantage, he must have the ability to move quickly and operate effectively in these adverse conditions. Airlift can make a friend out of these hostile features of nature.

Perhaps the most significant and pervasive single characteristic of the AirLand Battle is its emphasis on simultaneous close, deep and rear operations. Close operations are necessary to hold ground, prevent an enemy breakthrough, and ultimately defeat the enemy. Rear operations are necessary to counter and thwart the Warsaw Pact's attempt to conduct its own deep operations. However,

the boldest and probably most distinctive feature of the AirLand Battle is the deep operation.

Deep operations, which gave rise to the term extended battlefield, are those activities conducted behind enemy lines and intended to disrupt enemy operations and hinder his ability to conduct future close operations. (1:19) All levels of organization, from battalion to field army, conduct deep attacks with the same objective of disrupting enemy forces in depth and delaying follow-on echelons. The types of activities conducted during deep operations include interdiction, deception, surveillance, and interference with the enemy's command and control. (1:20) Regardless of the type of activity, deep operations extend the supply line at best. And frequently, these operations are conducted for extended periods beyond normal lines of logistical support.

One of the biggest challenges faced by the AirLand Battle doctrine is sustainment of the forces. Because of the doctrine's dependence on speed, maneuver, initiative and deep operations, sustainment is perhaps more important today than in any previous war. As an example, one armored division is expected to have a consumption rate of 600,000 gallons of fuel per day. During World War Two, this amount of fuel would have kept Patton's entire Third Army moving for nearly two days. (1:60) High consumption rates on an extended, broad battlefield will be the order of the day during the

next war. The challenge is to develop a system that can rapidly sustain operational and tactical efforts with critical resources such as manpower, arms, ammunition, fuel, replacements, and supplies.

Air Force Doctrine

Unlike the Army's statement of doctrine, which is consolidated in FM 100-5, the Air Force has subdivided its doctrinal statement into three parts: basic doctrine in AFM 1-1, operational doctrine in Air Force 2- series manuals and tactical doctrine n Air Force 3- series manuals. To an extent, this subdivision helps to explain an earlier comment regarding the general nature of the doctrine expressed in AFM 1-1 since the higher series manuals are more specific. Nonetheless, the comment is still valid as Army doctrine is much more concrete and specific than Air Force doctrine.

The purpose of Air Force doctrine as stated in AFM 1-1 is to, "...describe the best way to employ military forces to achieve objectives." (2:1-1) Obviously, neither the Air Force nor the Army can fight the war alone, and it is imperative that the doctrine of the two services be consistent.

The evolution of Air Force doctrine can be traced from the infancy of airpower. In 1926, air forces were part of the Army, and air elements were under the operational control of the ground commander. During the 1930's, the Army

began to recognize the potential of its air component and acknowledged a role other than support of troops in contact. Strategic bombing was employed early in World War Two, and by late 1942, the importance of air superiority was universally recognized. (2:A-1)

In 1943, a pivotal year for Air Force independence, FM 100-20 declared the air forces as coequal with land forces with neither the dominant power. Even at this early point, this field manual asserted that air power should be centrally controlled. (2:A-2-3)

Airlift was initially isolated to airborne operations during the war. By 1943, however, doctrine evolved to the point that resupply became a coequal partner in the airlift mission. Doctrinal growth for airlift forces stagnated during the post war years, particularly when compared to the development of doctrine for strategic and tactical components of the Air Force. The Berlin Airlift ushered in the glory days for airlift forces and stimulated renewed thought about the employment of this component of airpower. During this period, the distinction between tactical and strategic airlift was intentionally ignored, and emphasis was placed on big aircraft. Separation of strategic and tactical airlift would not resurface until after the Korean War.

The Korean War had two related major effects on airlift doctrine. First, it reestablished the role of

tactical airlift to support Army units in the field. Secondly, it reinforced the trend begun during World War Two away from airborne operations and toward logistics resupply. (7:6-9)

The 1960's ushered in the era of flexible response with its requirement to respond rapidly to a wide range of contingencies. Flexible response relies heavily upon mobility to operate effectively in any part of the world and counter any level of threat. Although it did not occur instantly, this new national strategy put the spotlight on airlift for the first time since the Berlin Airlift and led eventually to an ascendancy in the priority for airlift resources and for airlift as a mission in general.

As airborne missions constituted only a small part of airlift missions in Vietnam, this war tended to reinforce the focus on aerial resupply compared to airborne insertion. (7:14) Very little has occurred in the post-Vietnam era to change this direction. However, an argument can certainly be made that Grenada demonstrated the importance of the airborne mission. Whether or not it is the most important airlift mission is a question that need not be decided.

Although Air Force and airlift doctrine has changed and adapted to new concepts over the years, certain elements of the doctrine have remained static. Airpower, and specifically airlift, provide the advantage of speed, range,

and flexibility when compared to land and sea forces; and consequently, it is most effectively employed when these elements can decisively influence the course of the battle. Furthermore, airpower's full potential can best be realized when it is centrally controlled and decentrally executed. Finally, until achieved, air superiority must have the highest priority for airpower forces. Other concepts have shifted to reflect changes in national policies and new ideas, but these fundamental tenets about the characteristics and control of airpower have endured. (2:A-6) Each will be explored in more depth in the remainder of this chapter.

The preeminent characteristics of airpower, according to AFM 1-1, are speed, range, and flexibility. These characteristics lead in turn to the fundamental capabilities of air forces, including responsiveness, mobility and presence among others. (2:2-2,2-3) Airlift probably exemplifies these three capabilities better than any other element of airpower. Airlift forces can react quickly to respond to threats of hostility before any actions actually occur. In many areas, conflict can be prevented merely by mobilizing our combat forces and projecting power in the troubled area. Airlift forces not only assist air forces in projecting this airpower, but they serve as the primary means of rapid mobility for ground forces as well. This critical

mobility function is the backbone of our military might, and airlift is what makes it happen. (2:2-3)

Air Force doctrine is built on the foundation of the principles of war. Among the enduring warfighting principles with the greatest relevance for airlift missions are surprise, mass, economy, maneuver, timing, and logistics. (2:2-6) Because of its inherent speed and responsiveness, airpower has great capability to achieve the advantages of surprise, whether delivering a massive strategic attack with bombers or providing close air support with tactical fighters. Airlift has the unique capability of extending this enhanced advantage to ground forces through either airland or airborne insertion.

Airlift can also help to achieve mass at the critical time and place by rapidly shifting forces from one part of the theater to another. When used in conjunction with surprise and timing, the impact on the enemy can be devastating. Airlift forces can also assist ground forces in using maneuver to maximum advantage. By shifting forces quickly and surgically moving them to the optimum point in relation to the enemy, decisive advantages can accrue.

Air Force doctrine specifically singles out logistics as the "...one principle that must always be given attention." (2:2-9) The logistics system must be simple, responsive, and reliable. It must be effective regardless of

the terrain, enemy defenses, or weather. Logistics will frequently spell the differences between a successful campaign and one met with utter failure. Clearly, airlift is an essential part of this logistics system.

One of the two most fundamental tenets of Air Force doctrine is the primacy of air superiority. (2:2-11) The other, centralized control of resources, will be addressed in more depth later. Without control of the air, most other operations are seriously impaired if not totally denied. When the enemy has free reign in the skies, ground operations lose all flexibility, close air support is nearly impossible, and strategic bombing in unthinkable. Certainly, lack of air superiority constrains airlift as well. Although total air superiority may not be necessary for successful airlift operations, something very close to it is required.

Aerospace doctrine correctly identifies airlift as a projector of power for ground troops by virtue of its ability to airdrop, airland, or extract forces and supplies into a combat zone. Airlift can accelerate maneuver operations, provide logistics support, or insert reinforcements. (2:3-5)

In summary, it should be noted that the newest statement of Air Force doctrine in the updated version of AFM 1-1 emphasizes war fighting and unified action to a much greater extent than previous documents. The role of airlift is clearly key to both of these renewed items of emphasis.

Impact of AirLand Battle on Airlift Requirements

The AirLand Battle doctrine is a revolutionary departure from prior Army doctrines, and there is no question that it has a substantial impact on the requirements for airlift. And of course, this impact on airlift requirements dictates a review of airlift doctrine; and if necessary, an appropriate revision should be made. This subsection takes a close look at the impact of the AirLand Battle concept on the airlift mission.

As we review the history of airpower and airlift, several common threads seem to run throughout the course of important events. First, in virtually every conflict facing the U.S., airlift has become an increasingly important factor in the achievement of battlefield objectives. Secondly, as a result of this increasing importance, the requirement for airlift has almost always been grossly underestimated at the outset of hostilities. Airlift requirements have always grown as the conflict progressed, in terms of both number and variety of missions. During World War Two, General Hansell was able to estimate within 2 percent the number of bombers and fighters required in Europe. His estimate for airlift, however, was another matter. Figuring that 2500 transports would be sufficient, he erred by a factor of four. By the end of the World War Two, over 10,000 transports were operating in the European theater. (19:12) Thirdly, airlift

demonstrated a remarkable capacity for delivering huge amounts of equipment and supplies over extended periods of time. Finally, on many occasions, airlift was the only means of getting badly needed supplies to units in the field in time to affect the outcome of a battle, particularly units isolated from ground lines of communications. (8:II-14)

These consistent trends in the use of airlift that we observe running through the history of conflict are no mystery. They flow naturally from the inherent strengths of airpower. The obvious advantages of airlift when compared with surface modes of transportation include flexibility, speed, range, and responsiveness. Emergency resupply and insertion of reinforcements are possible within hours of notification. Additionally, airlift is capable of projecting vast amounts of power into a theater or battle zone in a short amount of time, thereby changing the entire character of the battle before the enemy can react.

Of course, airlift is not without its limitations. Adverse weather and enemy air defenses are serious constraints. Airlift is also limited by the weight and size of the items to be transported. Moreover, transport aircraft are dependent on the availability of secure airfields, a constraint that can be partially offset by using airdrop rather than airland techniques. The largest constraint by far, however, is the limited amount of airlift available.

For this reason, this scarce resource must be carefully allocated under a single manager.

As a result of the inherent advantages listed above and overall scarcity of transport aircraft, there is never enough airlift under even the best circumstances and regardless of the strategy employed by the theater commander. The challenge is to use this precious commodity as wisely as possible. Again the question addressed here is what impact does the AirLand Battle have on the requirement for airlift.

As described in more depth earlier in this chapter, the AirLand Battle doctrine anticipates fighting on an extended battlefield, with simultaneous close, rear, and deep operations. Clausewitz must have had this kind of battle in mind when he wrote about the fog and friction of war. Captain Daniel Cuda wrote an article about his experiences at an Army exercise simulating war with the Warsaw Pact. He described the battle as chaotic, confusing, and fast paced, with battlelines changing substantially in only a few hours. (9:62-64) This is the environment that the Army expects to encounter in a European war and the type of challenge that will confront our airlift forces.

There is virtually no limit to the types of units that will be supported by airlift. A joint MAC/TRADOC study predicted that airborne forces and light forces would almost always be inserted by airlift in a tactical operation. Light

forces would be frequently inserted by tactical airlift in deep operations. And heavy forces and Army aviation units would occasionally be supported by airlift. Air Force and Army support elements, such as engineer units, artillery units, air defense units and CSS units, will also rely heavily on airlift for rapid mobility. (8:IV-3) The same study concluded that replacement personnel, emergency resupply, and critical spare parts will almost always be delivered by airlift while routine supplies will frequently be air delivered. While these conclusions are subjective in nature, they point out the dependency on airlift anticipated by Army planners. (8:IV-4)

Heavy forces have traditionally been self sustaining, providing their own mobility capability. However, in future wars, even these forces will probably rely more on airlift to move closer to the area of operations. The C-17 is the aircraft of the future that will make this desire a reality. According to McDonnell Douglas, the C-17 prime contractor, a mechanized division could be moved 575 kilometers across Germany in less than two days. (8:D-5-6) Although the amount of airlift required is substantial (approximately 1000 C-17 sorties), this capability may mean the difference between a Warsaw Pact breakthrough and containment. At the least, it provides a great deal of flexibility for Army strategists.

Not only are there a large number of potential airlift users, but they will all be demanding faster aerial delivery to a point close to the unit's operational location. The joint MAC/TRADOC study indicates that airlift forces should transport heavy, air assault, and motorized forces to within 100-200 kilometers of the employment area, and infantry and airborne forces should be delivered to within 20-30 kilometers. (8:IV-8) The faster response and delivery requirement come directly from the AirLand Battle concept. Some of the most basic precepts of the doctrine are speed, rapid mobility, maneuver, and flexibility. The numerically superior Warsaw Pact threat demands that blocking forces and key reinforcement units be moved quickly to the front area. In most cases, there is simply insufficient time to rely on surface transportation.

Although the requirement for rapid aerial delivery is accentuated at the outbreak of hostilities when mobilization and initial positioning are at their peak, the AirLand Battle doctrine dictates fast, responsive airlift throughout the duration of the war. With its reliance on maneuver and operations in depth, mobility assets of all kind will be the life blood of the more agile Army. According to FM 100-5, units must be "... capable of responding rapidly to changing requirements...capable of shifting the main effort with minimum delay." (1:16) Clearly, this vision of great

battlefield agility demands a very responsive logistics system, and theater airlift will play a large role in its success or failure. Surface transportation assets will simply not be able to keep up with many phases of the anticipated fast-paced war. (10:1)

The concept of an extended battlefield is an integral part of the Army's new warfighting doctrine and will surely challenge the overall logistics system. Attempting to fight close, rear and deep battles simultaneously will require rapid positioning, repositioning and timely resupply. The deep battle is unquestionably the cornerstone of the AirLand Battle; and at the same time, it poses the gravest challenge for the airlift forces. Logisticans have nightmares about deep thrusts. And the Army's modern weapons, such as the M-1 Abrams tank and the M-2/M-3 Bradley fighting vehicle with their high fuel consumption rates, only exacerbate the problem (3:2)

Airlift forces play two primary roles in the deep operations: initial insertion of troops and equipment in the enemy's rear area and continuing sustainment of the deep force. There are no restrictions on the type of units to be employed in a deep operation. The composition of the attacking force will depend upon the battle situation, the enemy's position and relative strength, the terrain, and the tactical plan. However, light and airborne forces are

particularly well suited for this type of operation. Airborne insertion of combat troops by tactical airlift is an ideal way to achieve the kind of surprise and shock effect envisioned by FM 100-5. During the entire deep operation, from insertion to evacuation, the attacking force will normally be surrounded by the enemy and therefore totally dependent on airlift. (8:D-2-10)

Occasionally even motorized and heavy attack forces may be airlifted behind enemy line in a deep operation. Frequently, these heavier forces would rendezvous with light forces as part of an airhead. It is unlikely that an entire heavy unit would be airlifted because of the large amount of airlift required and the extended length of time. However, a partial airlift is possible. (8:IV-30)

The initial insertion of forces in a deep operation is only the beginning of the airlift challenge. Airlift has always been the prime vehicle for emergency resupply when ground units were cut off from their supply lines. The AirLand Battle and its in-depth attack philosophy will make this a much more frequent occurrence. Once combat forces are inserted behind enemy lines, they will be largely, if not totally, dependent on airlift for sustainment. This will be especially true for light infantry and airborne troops. (8:IV-30)

When heavy divisions participate in a deep attack, they will sustain themselves primarily by ground lines of communications. However, supplemental airlift support will normally be required for a variety of reasons. First, the nature of the deep attack requires heavy forces to move fast, and they will frequently outrun their supply chain. In addition, as the supply line lengthens through enemy territory, it becomes increasingly difficult to maintain security. After reaching a certain point, it is wiser to shut down the supply line and rely exclusively on airlift rather than exposing the supplies to enemy confiscation. Finally, heavy forces will invariably use large amounts of POL, ammunition, replacement parts and other supplies. (8:IV-30-31) Even the most efficient ground supply system would have difficulty staying ahead of the combat usage. To illustrate the magnitude of this resupply problem, an Army study projected that one armored division would use nearly 3.4 million gallons of POL in a seven day deep mission. (3:3) As another illustration, World War I armies used 65 tons of supplies each day. This figure rose to 675 tons during World War Two and 1000 tons in Vietnam. One can only speculate what the figure will be in a moving AirLand Battle.

Clearly, the deep battle poses a challenge to tactical airlift of near historic proportions. The type of aggressive initiative on an extended battlefield envisioned

by the AirLand Battle is far different from a mobility and logistics standpoint than the previous doctrine with its attrition strategy. It's much easier to fall back on your supply lines that it is to stretch them deep into enemy territory. Airlift is expected to meet a substantial portion of this logistics challenge.

Although the deep battle raises the most serious concerns about logistics support and battlefield mobility, the close and rear attacks will also require airlift support. As mentioned earlier, the AirLand Battle doctrine is based on speed, agility, and maneuver. Airlift will frequently be called on to quickly move units, particularly light and airborne forces, from one area of the battlefield to another. Of course, aerial resupply will also be required to supplement ground sources of supply and for emergency resupply. When the enemy breaks through the front lines in support of his own deep operations, airlift will be called to transport reinforcements into the embattled rear area. If necessary, the same airlift will evacuate civilians and ground support personnel. (8:IV-21)

In discussing deep operations and the challenge presented to tactical airlift, we made no mention of one of the greatest impediments to success: the threat. In support of Army doctrine, airlift must operate behind enemy lines and beyond the forward line of own troops (FLOT). In fact, air

Force doctrine itself specifies that tactical airlift will perform its mission as far forward as necessary. (11:24) This places the airlift operation in the midst of some of the enemy's heaviest air defenses, certainly in the medium to high threat areas. Specific threats in this area will include SA-6, SA-8, IR guided SA-7, SA-14, ZSU 23-4, small arms, air to air armed helicopters and possibly fighter aircraft if air superiority has not been achieved.

At the present time, theater airlift aircraft lack the capability to survive in this high threat environment. The C-130 and C-141 fly relatively slow and have no warning equipment or defensive countermeasures aboard the aircraft. These tactical aircraft are particularly vulnerable during airdrop operations, where they are low, slow, and lack maneuverability. The C-17 is better adapted to detecting and defeating the threat, but is is unlikely that even this more sophisticated aircraft would survive long in a medium or high threat environment without substantial defense suppression support.

Up to this point, we have discussed the impact of the AirLand Battle on airlift in general. We will now narrow our focus and look at the more specific impact on the requirement for airdrop sorties. As is true with airlift in general, airdrops are conducted for two different purposes. First, they are used to insert troops, supplies, and equipment into

an intended area of operations as part of a mass assault operation. Secondly, the airdrop can be used for sustainment of combat troops already in the field. The sustainment effort can include reinforcements, replacement items, or replenishment of stocks and supplies.

Airland operations have some distinct drawbacks when compared to airdrop. Aircraft on the ground are exposed to ground fire, prepared landing zones must be built and maintained, and cargo handling equipment must be prepositioned at the austere offload and onload sites. Furthermore, airdrop supplies are delivered literally into the hands of the user, often times behind enemy lines.

Of course, airdrop techniques have certain limitations and drawbacks as well. Airdrop loads are more difficult to rig, and they generally reduce the overall cargo carrying capability of the aircraft. Airdrop sorties are more sensitive to adverse weather and winds. In addition, airdrop supplies are more susceptible to damage or loss and possibly even to enemy recovery. (12:76) Because of these disadvantages, the preferred method of aerial delivery is airland, and airdrops are only made when there is no other feasible alternative.

As a combat unit moves nearer the FLOT, the number of available airstrips under friendly control will rapidly decrease and the threat to air forces will grow heavier. As

a result, units located near the FLOT, primarily brigade level and lower, must be supported primarily by airdrop delivery. (13:13)

Although airdrop may be the preferred method of aerial delivery under a wide variety of circumstances, the most likely scenarios dictating the use of airdrop missions include resupply to forward units inserted early, resupply to dispersed units, covering force operations, emergency resupply, airhead operations, and deep operations. (8:IV-27,28) Forward units arriving early in a conflict will normally be cut off from ground transportation assets and airfield availability cannot be counted on. When units are dispersed over large areas, ground logistics systems will become saturated quickly and airlift resources will be needed to fill the shortfall, probably using airdrop. Covering forces operate between the FLOT and forward edge of the battle area (FEBA) in a highly mobile capacity. Consequently, they will be frequently separated from fixed supply points and surface transportation. Again, airdrop assets will be called to fill the need. Emergency resupply may be needed anytime and under a variety of circumstances, but the most likely occasions is when a unit is unexpectedly cut off from its supply lines. Generally, airfields will not be available in this situation, and airdrop will be necessary. (8:IV-27,28)

An airhead operation exists when combat units are inserted, usually by airborne assault, into enemy territory. The unit typically is isolated from other friendly forces. (8:IV-29) Initial insertion into the airhead and sustainment during airhead operations is accomplished almost exclusively by airlift. Although small airfields not under enemy control may occasionally be available, airdrop is the primary method of resupply, usually to a number of geographically separated units. (8:D-2-5)

Airhead operations are frequently part of the AirLand Battle's attack in depth, but it is not the only form of deep operation. As mention earlier, the deep battle is the cornerstone of the AirLand Battle; and it this revolutionary change in Army thinking that has the greatest impact on the requirement for airlift in general and airdrops in particular. Units engaged in combat forward of the FEBA will rely heavily on tactical airdrops for sustainment, probably more heavily than even the Army realizes or is prepared to admit. To complicate the problem, when units operating behind enemy lines need supplies, replacements, ammunition, or parts, they need them now. Tomorrow or maybe even an hour from now will be too late. Consequently, not only does the deep battle mean increased airlift requirements, it also means the system must be more responsive than ever before.

The Army's current emphasis on light forces, largely because of their suitability for maneuver and deep operations, also influences the requirement for airdrops. The Army is currently establishing five light infantry divisions and the trend appears upward. (12:75) The light division is trained and equipped to move rapidly on short notice with the objective of getting to a hot spot fast enough to make a difference. (14:56) Although the role is best suited for lower intensity conflicts, they will perform many of the same functions in a general war with a special eye on their ability to maneuver rapidly.

Because of the limited amount of equipment and supplies carried forward by a light division, they are especially dependent on airlift forces for both initial insertion and subsequent sustainment. This dependency is particularly acute when they operate in deep positions for extended periods. A light division can sustain itself for only 48 to 72 hours and resupply must begin as soon as the first units reach the objective area. (12:75) With maneuverability as one of the primary characteristics of the light division and operations typically conducted in the enemy's rear, airdrop will be the primary means of resupply. This resupply must be accomplished on a regular basis regardless of the threat or weather conditions.

From the foregoing, it is apparent that the AirLand Battle marks a major change in direction for the Army with significant implications for airlift. Airlift forces must have the capability to operate effectively and precisely in all weather conditions, both to insure continuous resupply and to enhance survivability. Additionally, airlift aircraft must be survivable in a medium to high threat environment. This improved survivability must come either through new avoidance tactics, better detection equipment, more survivable airdrop techniques, or a combination of all three.

When delivering supplies and equipment to units engaged in deep operations, a Combat Control Team (CCT) will frequently not be available. Joint procedures must be developed and equipment procured to accomodate precise airdrops in an isolated area despite lack of communications with the ground. (15:6-1) Army and Air Force planners must also address improved techniques for aerial delivery of outsize cargo and massive amounts of fuel. Acquisition of the C-17 will significantly improve outsize cargo capability, both for airland and airdrop. However, better equipment and improved joint procedures are needed for the vast amount of fuel that will be airlanded and airdropped in a war fought in depth. If an armor division is cut off from ground sources of supply, it will require aerial delivery of over one half million gallons of fuel per day. Airlift forces must be

properly trained and equipped to react instantly to this kind of requirement.

In conclusion, the Army's AirLand Battle doctrine has a tremendous impact on the requirements for airlift. Emphasis on the extended battlefield and deep attack, speed, rapid maneuverability, and agility all add up to one thing: the demands on airlift will reach unprecedented proportions. It would be dangerous to ignore or give lip service to the upgraded requirement. Army and Air Force planners must face the issue squarely to determine if the Air Force has the capability to provide what the Army will surely ask. And if not, what can be done about it. Planners must also take a close look at the threat to determine if airlift forces can reasonably operate in the anticipated environments. Again, if they cannot, what must be done to enhance our capability. In short, the Army and Air Force must integrate airlift doctrine and capabilities with AirLand Battle doctrine. The remainder of this report will address these issues.

Consistency of Army and Air Force Doctrine

Thus far, this chapter has reviewed Army and Air Force doctrine and assessed the general impact of the AirLand Battle on the requirement for airlift. We will next probe deeper into the doctrines of the two services and attempt to answer a most important question: Are the two doctrines consistent? That is, are we both heading down the same road?

The most important word in the military vocabulary today is "jointness". This is more than just a catchy little phrase; with military cutbacks and stingy defense budgets a fact of life, it is crucial for the Army and Air Force to develop cohesive, compatible, and synergistic doctrine. The Air Force's endorsement of the AirLand Battle doctrine was a step in the right direction. The next step is to insure that our own Air Force doctrine supports and complements the ground doctrine we have endorsed. This Air Force doctrine, in turn, should guide our development, procurement, and training strategy for the future. As long as air and ground forces are considered coequal and interdependent, the fundamental doctrines must dovetail to insure unity of action.

Certainly at the upper levels of the doctrinal hierarchy, the doctrines of the two services are remarkably compatible. The AirLand Battle relies heavily on rapid movement and blitzkrieg style attacks. Almost as if in direct support of this concept, AFM 1-1 describes the characteristics of airpower as speed, range, and flexibility. Perhaps more than any other Air Force combat group, airlift forces recognize the importance of speed and responsiveness. The doctrinal authority for tactical airlift, AFM 2-4, warns that, "In battle, success or failure may be separated by

minutes and the price of failure may be extremely high". (16:14)

Whereas FM 100-5 emphasizes the importance of maneuver and surprise, Air Force doctrine points to the principles of war, including surprise, mass, economy, and maneuver, as guiding wisdom. The inherent readiness of airlift forces "...for rapid movement provides for surprise and concentration of capabilities and allows maximum economy of force..." (16:1) Similarly, both Army and Air Force doctrines espouse the importance of concentration and mass. According to AFM 2-4, there are three principles of war which should be given special considerations for airborne operations. These highlighted principles are simplicity, surprise and mass. Although Air Force doctrine speaks in more general terms, there is obvious agreement between the Army and Air Force in the most fundamental doctrinal principles.

Apart form the general characteristics and points of emphasis described above, AFM 1-1 takes a positive stand in two definitive areas. These two pillars of Air Force doctrine are centralized control and the primacy of air superiority. Because of their importance to Air Force thinking and strategy, these enduring concepts will be discussed in more depth with a focus on their relationship to Army doctrine.

The Air Force is unequivocable and unwavering in its advocacy of air superiority. "The first consideration", dictates AFM 1-1, is gaining freedom of action; and the freedom can be secured by controlling the air. Control of the air is the "...first priority for aerospace forces". (1:2-12) Clearly, air superiority is not an end in itself, and AFM 1-1 makes it clear that control of the air is only beneficial to the extent that it furthers other objectives. In the absence of air superiority, other operations become more difficult or impossible. Ground troop movements, close air support, airlift mission, and logistics lines can be hampered or totally stopped by unimpeded enemy air. The initiative during ground combat can be quickly lost and the momentum can shift to the enemy.

Air superiority gives commanders at all levels flexibility and freedom they need to pursue the optimum strategic plan of attack. When we control the air, the ground commander is free to employ his forces at the time and place of his choosing. He is constrained only by his own resources and his imagination.

Of course, air superiority is a relative concept. There is no need to achieve total air superiority at all times and at all places. On some occasions, total control of the air may be necessary in areas around the battlefield. At other times and places, partial control may be sufficient.

In many areas and points in time, air superiority is not necessary or desirable at all. The degree of control needed depends on the degree to which enemy airpower will interfere with the air and ground commander's desired freedom of action.

Is the Air Force's focus on air superiority harmful or inconsistent with the Army's warfighting doctrine? The answer is decidedly "no". Aerospace forces certainly must support the Army in other, more tangible ways, including airlift, close air support, and interdiction. However, the inescapable fact remains that these missions cannot be performed until and unless some measure of air superiority is obtained. The airlift mission provides an ideal example. As discussed earlier, the AirLand Battle concept will rely heavily on airlift support, both for initial insertion and movement of combat troops and for subsequent sustainment. The deep battle, in particular, cannot succeed without a continuous flow of airlift resupply. However, airlift aircraft are highly vulnerable to offensive enemy air attacks. Airlift missions simply cannot be performed in the same air space as enemy fighter aircraft without dedicated fighter escorts: and even with escorts, airlift aircraft are highly vulnerable. This statement is particularly true for airdrop and airborne missions.

The Army must understand that air superiority is a prerequisite to achieving other objectives. Control of the air must be achieved first, and fighter aircraft must be dedicated to this role until the objective is reached. Of course, Army ground support missions will also be performed, but they won't be the Air Commander's top priority. The Air Force, for its part, must never lose sight of the fact that air superiority is not an end in itself. Once sufficient control of th air is obtained at a given time and place to give the desired freedom of action, the priorities should shift.

The second pillar of Air Force doctrine is centralized control of air assets. Air power is most effective when all aerospace resources are orchestrated as a whole by a single commander. When assets are controlled by several different commanders, the activity is fragmented and unity of effort is lost. On this point, AFM 1-1 is again unambiguous when it resolves that "Unity of command is imperative to employing all aerospace forces effectively...To take full advantage of these qualities, aerospace forces are employed as an entity through the leadership of an air commander."

The Army reluctantly supports this concept of centralized control, although the terms of the agreement are hazy at best. Until 1984, the Army insisted that all air assets delegated by the theater commander should fall under

control of the corps. (17:48) In January of that year, however, the two service chiefs signed the Joint Attack of the Second Echelon (J-SAK) Joint Service Agreement. This document formally recognized the notion of independent and coequal land and air component commanders. Under the agreement, the ground commander prioritizes Battlefield Air Interdiction (BAI) targets, but the air commander still controls all air assets in the prosecution of the overall interdiction campaign. (6:121;1:3-3) Of course, the air commander selects the targets for pure air interdiction (AI) missions.

The issue becomes somewhat muddier when NATO plans are assessed. Under NATO guidance, BAI is separated from pure AI, and the air commander controls only the AI effort. (6:122) Regardless of which version of the doctrine reigns supreme if a war in Europe is ever fought, this issue should not be considered a serious doctrinal roadblock. In the first place, the debate primarily centers around who controls the air assets between CAS and AI. Under NATO rules, the Army controls the middle ground; whereas under the J-SAK agreement, the Air Force has control. Either way, the job gets done. Secondly, the theater commander, in the final analysis, will determine how air assets are allocated and controlled in his theater. Thus, although this issue may not be entirely settled, it does not constitute an inconsistency

between Air Force and Army doctrine; or at least it is not an inconsistency that should cause a great deal of alarm.

If air superiority and centralized control of air assets are the pillars of Air Force doctrine, then the AirLand Battle doctrine rest squarely on the shoulders of the deep attack. One of the four basic tenets of the AirLand Battle, the attack on the enemy's second and third echelon forces has a preeminent place in Army doctrine. According to FM 100-5, "...successful deep operations create the conditions for future victory." (2:19) Clearly, the Army has selected the deep attack as the centerpiece of its grand strategy. The obvious question is, how well does the Air Force support this basic tenet of Army doctrine.

Although Air Force doctrine clearly does not depend on the deep attack to the same extent as the Army, AFM 1-1 recognizes its importance to the achievement of success. "While the urgency of enemy actions may require direct attacks against forces in contact, efficient use of air forces should emphasize attack in depth upon those targets that deny the enemy the time and space to employ forces effectively." (1:2-14) Less space is devoted in AFM 1-1 to describe the deep battle or extoll its virtues, but the language found there is remarkably similar to that in FM 100-5.

The Air Force's strong endorsement of the attack in depth concept has serious implications for tactical airlift forces. As discussed earlier in great detail, the Army's logistical support problem is greatly magnified when operating behind enemy lines. Moreover, the two conditions which favor airlift over ground logistics, the need for speed and the nonavailability of ground lines of communications' (LOC), will be more prevalent in deep operations. As a result, airlift will be called with much greater frequency, and the demands created by intense enemy threats will be higher than ever before.

There can be little question that Air Force doctrine is both consistent and serious about deep operations. This seriousness applies to strategic bombing, interdiction, and close air support as well as tactical airlift. Airlift doctrine is unambiguously dictated in AFM 2-4 where airlift forces are committed to "...deliver...personnel, equipment, and supplies to ...combat areas, at any level of conflict, throughout a wide spectrum of climate, terrain and conditions of combat, as far forward in the combat zone as requirements demand." (16:3) The phrase "as far forward in the combat zone as requirements demand" is a mouthful, with serious overtones for airlift forces. When the Air Force tells the Army that it will support them with airlift no matter where they may find themselves and regardless of the threat, we are

making a big promise, one that may be difficult to keep. We will say more about this later. For present purposes, suffice it to say that the Air Force has maintained strong doctrinal commitment to the deep attack.

In summary, we can say with little hesitancy that Air Force and Army doctrine are consistent and closely aligned. To be sure, there are differences of viewpoint in some areas and points of emphasis are not always precisely the same. However, in terms of the basic vision on how to win a European war using maneuver, speed, mobility, and attack in depth, the two services are remarkably in step.

CHAPTER IV

DOCTRINE TODAY: ARE THE LESSONS INCLUDED AND IS IT FEASIBLE?

Introduction

The stated purpose of this paper is to look at the doctrine that guides MAC on the employment of airlift airdrop forces in a combat environment. For the purpose of this paper, we would like to think of doctrine as principles of guidance, established through past decisions, accepted as valid and authoritative. According to the definition then, airlift airdrop doctrine should provide the principles of guidance for airdrops, be developed from past decisions concerning airdrops and be the accepted authoritative and valid source of guidance for airdrops. We will assume if the airlift doctrine is printed in AFM 1-1 or in AFM 2- series manuals then it is considered to "be the accepted authoritative and valid source of guidance for airdrops." Hence, the only areas left open for discussion concerning airlift doctrine meeting our criteria for doctrine initially set up are: "principles of guidance, established through past decisions." In this chapter, we will attempt to analyze airlift doctrine against this criteria.

Up to this point the paper has looked at history and doctrine separately. Based on the information that has been gleaned from the sources, our stated goal is to now compare

this information. In the conclusion of Chapter II, we identified the threads of doctrine that have followed airlift through the years or evolved with the modern airlift forces. These can be considered lessons learned for the employment of airlift in the past or guidance "established through past decisions."

Thus, having looked at the lessons of history and assessed current doctrine for internal consistency, this final chapter will attempt to tie everything together and analyze the doctrine of the Army and the Air Force for feasibility and reasonableness. That is, given that Air Force and Army doctrine are consistent, do they make sense and are they achievable? Clearly, the most articulate and inspiring doctrine in the world is worthless if the military lacks the means to execute it. Is our doctrine a valid principle of guidance?

We will look first to see if the doctrine violates the lessons of history. Secondly, we will assess doctrinal feasibility by focusing on the operational factors of threat, weather, and resources. Resources will be subdivided into two subsections: force structure and aircrew training. Training is doubly important as a factor in the criteria. First, as a direct spin off of doctrine as defined by the Air Force. "Aerospace doctrine gives direction to our training." (1:4-6) Secondly, as a definite factor enhancing the

logistical efficiency of our airlift resource in the field of aircrew training. Hence, against these factors, we will measure the effectiveness of our airlift doctrine.

History: Established through past decisions?

As mentioned in Chapter II, there are several threads of doctrine that have provided guidance continuously throughout the development of theater airlift. In this portion of the paper, we will challenge our current doctrine with those historical threads. Have we learned our lessons and included them in our current doctrine?

First, the one thread of doctrine surviving from the first employment of airpower until today, is centralized control and decentralized execution. Airlift suffered under the same yoke of dispersal of assets during World War Two as did tactical fighter forces. The absence of this doctrine for tactical airlift was evident in 1941 when General "Hap" Arnold cautioned against too close association with the Army units for it would lead to trivial assignments for the transports and they would be wasted on pure logistical missions when they had much more important work to do. (2:3) As the bigger operations in World War Two materialized, principally "OVERLORD", "MARKET", and "VARSITY"; the airlift forces were consolidated into much larger organizations composed of only airlift assets. This requirement was dictated by the necessity to get maximum performance from

the assigned transports. In operation "MARKET" for sure, there was not enough airlift to go around which may have contributed to the failure of the entire operation. 'Lt Gen Brereton, senior American officer involved, felt that MARKET could only achieve full surprise if all airborne forces landed at the same time. This never happened. Air transport was unavailable in sufficient numbers to allow the "MARKET" force to be committed simultaneously. ... the landing stretched over three days." (3:9) The doctrine that emerged was clear on one point: theater troop carrier resources belonged under centralized control, normally within a numbered troop carrier air force. Priorities among the airlift users would be established by the theater commander through an air transportation board with triservice representation, outside the air component structure. (4:26-27)

When Korea came along and the Air Force was a separate service, a central tasking organization was employed. Lt Gen Tunner commanded the FEAFCCC, which responded to a joint organization for tasking. The joint organization maintained the 70 tons per day airdrop capability which quickly expanded to 250 tons per day during the Chosin Reservoir emergency. (5:258) This agency took all the requests, Army, Air Force, and Navy, and insured that the

airlift forces responded to the critical airlift needs first and the routine as necessary. They also insured that the assigned airlift forces were used to the maximum efficiency. Thanks to this central control, the airdrop capable forces were able to quickly expand from airdropping only 16 tons on 29 November 1950 to the 250 tons on 1 December 1950, even though they only advertised a 70 ton per day capability. Doctrine development was fast during those early days.

Vietnam saw increased use of airdrop forces and a refined command and control system. The Korean experience with centralized control was expanded to include separation of the control apparatus from the joint operations center. A central command post with smaller teams at forward airfields bore little resemblance with printed doctrine in AFM 1-9, which was current at that time. (4:103-104) By 1966 and the addition of C-130s, the theater airlift effort had evolved into a high volume, 24 hour a day, air logistics service linking the major airfields. Aircraft were shuttled in from home stations outside South Vietnam, reducing the need for in country logistics support, maintenance facilities and ramp space, which in turn produced higher daily flying rates. (4:180) The efficiency of this operation absorbed the emergency airdrop missions without disturbing the normal logistics resupply missions.

Today, we still maintain the streamlined centralized command and decentralized execution concept. Through MAC's numbered air forces, air divisions, and a commander airlift forces (COMALF), today's theater airlift airdrop capability can be efficiently managed. In the central region in Europe, the personnel are identified and in place to execute the airlift mission, if required. The theater airlift forces have definitely learned and established this thread of doctrine as a principle of guidance, an important one learned from history.

Secondly, basic airlift doctrine continues to drive the way that we train. "The Air Force has a primary function to train combat and support forces to ensure the conduct of prompt and sustained aerospace combat...the goal of producing a credible, cohesive warfighting team." (1:4-6) Examples throughout history prove if airborne operations or airdrops are to succeed, the theater airlift forces must be proficient at their missions.

In Sicily, "With neither prior experience nor a joint command or planning organization to guide this first large-scale assault...allowed aircrews little time to practice the new tactics,...but troop carrier leaders were optimistic. Their optimism was ill-founded." (2:5) The entire airborne operation was a dismal failure. The Swing Commission identified the problem. "The problem had been one

of delivery rather than the concept of mass employment of airborne forces"; the result was further training for troop carrier units. (2:6) Good training results in confidence and accurate employment of the fragile airborne forces. "Experiences in Sicily emphasized the need for a joint airborne planning headquarters...and proficient troop carriers." (2:7)

The Germans learned the same lesson. "Germany had very few trained paratroopers left and no specially trained pilots at all to drop them, and the whole operation (Battle of the Bulge), quickly came unstiched. Just ten of 105 transport planes reached the proper DZ near the town of Malmedy, fifteen miles behind the American lines. A dozen pilots became so befuddled in the darkness that they released their paratroopers over the peaceful German city of Bonn, fifty miles away." (6:36-37)

The lessons have been learned--train the way you intend to fight and your doctrine should guide your training. "URGENT FURY" in Grenada proved theater airlift is ready to take the Army to war right now. The airlift and airborne forces employed had trained together previously. Due to the intense and realistic training guided by current doctrine, and without a dress rehearsal, they accomplished a difficult mission. Our current joint airborne/air transportability training (JA/ATT) program is on track with our doctrine.

The principles of war have not changed nor have their importance to each operation decreased. Surprise, maneuver and mass, for the purpose of this summary, can be lumped together for discussion. Theater airlift is extremely aware of the critical role that it plays in insuring that all three are achieved in any operation.

Airlift crews are also well aware of the importance of surprise. "... (S)uprise is an important factor that enhances an airborne operation's chance of success." (8:9) Operations security is practiced in all exercises and during local training missions by airlift aircrews. Airlift crews will not destroy the effect of surprise during the planning or the execution phase of an airborne operation.

The use of maneuver is limited. One recent example comes to mind where the use of maneuver aided the success of an operation. Due to the threat and to reduce time under the canopy, the commander of the Ranger Battalion ordered the jump on Port Salinas to be conducted at 500 AGL, instead of the usual 1000 feet. Only one Ranger was injured during the jump. (7:99-103) As a result, the antiaircraft guns on the ridges surrounding Point Salinas airfield were ineffective, but they did cause the number two and three aircraft to break off the first run-in on the DZ until supporting fire could suppress the them.

To theater airlift, mass translates to placing the paratrooper and his supplies on the DZ. Airdropping is an art and not a science. Constant upgrade training is required as airdrop crew members mature and are replaced by less experienced personnel. Each TAS and airdrop tasked MAS uses a majority of allotted local training time perfecting airdrop procedures and techniques. Operational Readiness Inspections (ORI), graded by headquarters MAC personnel, test each tactical airlift wing's (TAW) and military airlift wing's (MAW) ability to meet stringent airdrop criteria, day and night, and if applicable, in adverse weather conditions. The results reaffirm that each unit is capable of satisfactorily meeting the criteria specified by our doctrine and our guarantee to the Army for airdrop accuracy. By doing so, each unit can assure the Army mass will be achieved on the DZ in every operation by the theater airlift aircrews.

Logistics can be easily translated into two words for theater airlift: employment and sustainment. This means taking the combat forces into battle and keeping them supplied while engaged in combat. Two basic methods of aerial delivery are used: airland and airdrop. The most demanding is airdrop, the method we have focused on here. We have already discussed the accuracy of airdrops as the primary factor in achieving mass on the DZ and how airlift forces are trained to produce accurate airdrop results. We

have also discussed the relationship of our entire training program with our doctrine. Now we will see if our current operational doctrine reflects the lessons that weather, threat, and adequate airlift resources have provided down through the years.

"...(T)hroughout a wide spectrum of climate, terrain and conditions of combat,..." is the airlift operational doctrine statement from AFM 2-4. (15:3) It is a valid and supportable doctrine. We know weather has inhibited employment and sustainment by airdrop throughout history. In some instances, weather was a contributing factor that restricted sustainment of a ground force. During the efforts at Stalingrad, Bastogne, and Khe Sanh; weather lowered the average daily tonnage of supplies delivered significantly. (4:309, 6:85, 16:266) Employment has always been restricted by weather. Rugby force was severely hindered by weather in Southern France. Their complex plan turned into a nightmare when fog blanketed the DZs and troop carriers scattered units, supplies and equipment over the region, some as far as 25 miles from their objectives. (8:78) Operations as large as "OVERLORD" had problems, also. Due to weather, "Of the 13,000 American troops dropped, less than 10 percent landed in their DZs, but 60 percent landed within two miles of their zones." (2:9) Despite this airlift imposed problem, the paratroopers were successful in seizing their objectives.

with AWADS and SKE, theater airlift forces have overcome most weather problems. Both authors have participated in JA/ATT missions, delivering paratroopers to cloud covered DZs invisible from the air, IMC from takeoff to landing. Since the development of GRADS during Vietnam, airlift airdrop forces have significantly improved their all-weather airdrop capability. Virtually all air crews are either AWADS or SKE qualified at the present time. At the present time, airdrop airlift forces can meet their weather doctrine statement, but we must continue to upgrade our all-weather capability with new technology.

The next question after, "Can sustainment airlift get there in any weather?" is "Can sustainment airlift get there through the threat?" Our operational doctrine in AFM 2-4 states: "...as far forward in the objective area as requirements demand." (15:3) With the Army's current AirLand Battle doctrine emphasizing deep attacks, our sustainment missions could take us well across the FLOT. Using our scenario of the central European battlefield, we have just entered the most lethal airspace ever known to air combat forces. Jeffery Record assessed the threat in this region as he talked of a possible replacement for the C-130. "In any conflict with the Soviet Union or its well-equipped Third World client states, U.S. tactical airlift almost certainly will face a larger number of more lethal threats than it

confronted in Vietnam." (9:26) Everyone questions theater airlift's ability to survive in this environment. Major Boston in his paper on airlift doctrine states: "Examination of the historical role of tactical airlift reveals constraints and limitations that very much affect future operations. Air superiority is vital, as is surprise and neutralized ground defenses." (2:20) We are in serious doubt that the Warsaw Pact and Soviet ground defenses will be neutralized in a corridor wide enough to permit airlift transports to operate behind the FLOT without a tremendous drain on resources.

Available only in limited quantities, the large number of specialized weapon systems required to clear a corridor wide enough to allow airlift aircraft to operate behind the FLOT and FEBA, are not likely to be available. Present day theater airlift aircraft are not equipped to defeat the threat, either with active or passive measures. History lessons in this area are conclusive--airlift forces cannot survive in a high threat environment without suppression of enemy air defenses (SEAD) missions in support. Even in "URGENT FURY", the ZSU 23-4 antiaircraft weapons in place, if properly employed, could have shot down the C-130s as they crossed the DZ at Port Salinas airfield. Only a change in tactics by the Ranger battalion commander, prevented the C-130s from flying directly through barrage

fire. Even then, the last two aircraft requested SEAD from an AC-130 overhead before dropping. (7:99-103) Remember, Grenada is a third rate, third world island nation, yet it possessed the capability to seriously hamper a vulnerable mass airdrop insertion by transport aircraft. Jeffery Record says there has been such a growth of pervasive, and more lethal threat systems, ground and air, that brings into serious question whether a permissive environment will exist to provide the relative safety for transport aircraft that occurred in past history. (9:16) We do not think that current doctrine in AFM 2-4: "...as far forward in the objective area as requirements demand.", reflects our criteria of "...established by past experience." (15:3) The Army's Airland Battle doctrine definitely goes deeper on the battlefield in its demand for airdrop sustainment than history tells us our current theater airlift forces can follow and survive.

Likewise, reading our operational doctrine, you will not find any statements that limit our sustainment operations due to a lack of airlift resources. The only statement of "how much" is implied in the brigade airdrop capability. The yet unpublished Worldwide Intratheater Mobility Study (WIMS) does not even address airdrop requirements according to telephone conversations with individuals who have read the first draft of the study. QITARS mentions that the

enough". History also proves, with only one exception, if there is not enough airlift available, the missions are doomed to failure. Right now no one can even quantify the requirement. "Unlike strategic airlift, the requirement for which are driven by a handful of comparatively simple and well-defined planning scenarios that can be calculated in linear terms, tactical airlift is devoted mainly to the delivery of relatively small amounts of 'beans and bullets' to forces in the field--a highly scenario-dependent, micro-distributive task that is sensitive to a host of unpredictable variables, and that places a premium more on such things as sortie rates and numbers of planes than upon gross ton-mile productivity." (9:v) The C-17 will relieve some of the requirement on theater airlift by direct delivery; but if the next conflict develops as quick and is as intense as the 1973 Arab/Israeli War, only the C-130s will be dedicated for theater airlift during the early stages of the conflict. All the air refueled assets (C-17 and C-141) will still be flying strategic sustainment missions from CONUS to the theater in the first five days.

During the past five years, the number of theater airlift forces have declined rather than increased. Two active duty squadrons have closed and their aircraft spread throughout the system, replacing aircraft lost in

accidents and not replaced. The crew ratio in active duty C-130 squadrons has recently been reduced. As the budget shrinks, so do our theater airlift forces; but the requirement grows and our doctrine remains unchanged. Jeffery Record observed the trend for theater airlift requirements: "Both outside experts and responsible officials agree that future requirements almost certainly will be more demanding than past needs. Among the factors cited in support of this conclusion are: (1) the post-Vietnam expansion of U.S. defense commitments into nontraditional U.S. military contingency theaters of operattions lacking adequate infrastructures of surface lines of communications; (2) the expanded capablities of U.S. strategic airlift, which will increase the burden on intratheater distribution of troops and supplies; (3) changes in U.S. Army operational doctrine that would expose theater airlift to much greater risks on the battlefield; and (4) the emergence worldwide of a variety of increasingly lethal threats to tactical airlift's wartime survivability." (9:vi) Both authors agree, there is not enough theater airlift resources to support the anticipated emergency airdrop sustainment the Army units will almost certainly require in an intense conflict in the Central European region, unless our history lessons are wrong.

What does the future look like--worse. Dedicated theater airlift forces are declining and wearing out and there is no plan in the near future to change this trend. "Given the fact that U.S. tactical airlift requirements are growing rather than diminishing, and given the probability that a new airlifter will not be available in numbers until the end of the century, it would be imprudent to cut existing fixed-wing tactical airlift capabilities in the interim." (9:39) We are not learning from our historical lessons in the area of sufficient theater airdrop resources and not reflecting those lessons in our operational doctrine.

"The driving force behind tactical airlift has always been the Army's need for battlefield mobility, and the lessons of combat provided the basis for tactics and doctrine that emerged with the growth of airlift forces. Doctrine developed as experience revealed the capabilities and limitations of tactical airlift forces." (2:1) No one ever anticipates the need for sustainment by airdrop, but in todays world, everyone knows it exists. Then when they realize the requirement exists, they call for airlift, just as Lt General Edward N. Almond, X Corps Commmader, did on 29 November 1950 in Korea. FEAFCCC had just delivered all supplies requested that day, 16 tons worth. Lt General Almond requested 400 tons be airdropped the next day to the surrounded Marines at Chosin Reservoir. (5:258-259) In 1950,

the airlift system surged to support the Marines at Chosin Reservoir and saved the day. In 1990, given the anticipated routine requirements of the AirLand Battle, history tells us there will not be enough surge capability. We may not be able to provide the apparent, unlimited theater airlift support in our, as yet unstated but alluded to, total airlift support doctrine. You may call, but no one will be home to haul!

Doctrine: Is it feasible?

With that indepth review of lessons we have or haven't carried into our present day doctrine from history, we now turn to an analysis of the feasibility of Air Force doctrine to support AirLand Battle doctrine. In the final analysis, this is the litmus test of effective policy; but there is a tendency to brush over this important area with the "Pollyanna" attitude of "we can do anything; once we set our mind to it." As ingenious and resourceful as Americans have proven to be, there is a limit to what we can accomplish by sheer strength of will. If our doctrine cannot be supported or executed, it is worthless. We must be careful not to enter a war with a doctrine we cannot support. The stakes are high and the consequences of miscalculation can be catastrophic.

As outlined in the introduction to this chapter, we will attempt to analyze the feasibility of airlift airdrop

doctrine. As AFM 2-4 states: "...provide airlift throughout a wide spectrum of climate, terrain and conditions of combat, as far forward in the objective area as requirements demand." (15:3) So, by focusing on the operational variables of weather, threat, and resources, as we did in our analysis of lessons from history, we will analyze our current doctrine. These three factors are not the only considerations for formulating doctrine, but they stand out as key elements that contribute disproportionately to success or failure. This is particularly true when applied to airlift airdrop doctrine.

Anyone who has ever flown in Europe, or even stood on the ground for that matter, knows the weather is bad for four months out of the year and lousy the rest of the time. This simple truth has serious undertones for all aerospace forces, and airlift is no exception. Ask the men at Bastogne during the Battle of the Bulge, and they will tell you how serious it is. They waited for what must have seemed an eternity for the weather to break so badly needed supplies and replacements could be airdropped to them. If the weather had remained bad for a few more days, the German counteroffensive might have had a different ending. (6:85)

The AirLand Battle concept will not allow us to take the chance that the weather will cooperate with our plans. When a unit operating deep behind enemy lines needs reinforcements, ammunition, fuel, or supplies, it needs the

support now, not when the weather clears. The simple truth of the matter is that we can no longer pick the day or the hour that we will provide airlift support. The Army's previous doctrine of attrition warfare with its concept of defensive entrenchment did not place the same demands on airlift forces and logistics systems. After all, if the weather prevented aerial resupply, the Army could always dig in deeper to their defensive entrenchment or even fall back further on their supply lines.

The AirLand Battle doctrine, however, relies on maneuver, speed, initiative, and deep thrusts into the enemy's territory. This means that logistical support must keep pace since thee Army will frequently have no supply line to fall back on; and even if it does, the momentum and tactical surprise will be lost if the Army must wait for sustainment. Consequently, with the AirLand Battle doctrine's imperatives in mind, it is probably more important than ever before to have an all-weather airdrop resupply capability.

Flying in this weather is no problem, as we have had that capability for decades. The trick is to precisely put an airdrop payload on the DZ without visual contact with the ground. And again, we have this capability; however, it is a limited capability and enhancements and upgrades are needed.

All theater C-130 aircraft, as well as C-141 aircraft, are able to fly formation IMC using SKE. However, only a few C-130's are equipped to make airdrops with no visual contact with the ground or no reliance on external navigation aids. These are AWADS C-130s. The AWADS system worked well in combat in Vietnam, but it has aged. Problems with maintainability and the high degree of crew proficiency are limitations. The relatively new palletized inertial navigation system (PINS) add a new dimension to the AWADS and significantly increases capability while reducing crew workload.

The next planned upgrade is the self contained navigation system (SCNS). The SCNS will greatly improve accuracy, reliability, and maintainability. Furthermore, less experienced crew members should be able to use the system with a much greater likelihood of success than realized with the present AWADS. We are actively trying to maintain our capability to support our all-weather airdrop doctrine statement.

The C-141 fleet and non-AWADS equipped C-130's can only make IMC airdrops by reference to a ground navigation aid. The C-141 can make airdrop in weather when a radar beacon or zone marker beacon is placed on the DZ, provided the aircraft is properly equipped. Similarly, the C-130 can make an airdrop using the radar beacon. The obvious drawback

is the requirement for a ground party, either a CCT or the Army unit itself, to transport and place the radar/zone marker beacon on the DZ. In the absence of a ground navigation aid, these aircraft must make airdrops by visual reference to the ground or by following a C-130 AWADS equipped aircraft to the DZ and dropping on its command.

The Air Force does have an IMC airdrop capability. And significant upgrades are currently being made to the C-130 system to enhance its capability. At present, however, the vast majority of the C-130 fleet and all C-141's must rely on external aids to make airdrops in IMC. This may constitute limitations to our doctrine statement, but we can say our doctrine is feasible without contradiction.

The second area for discussion in evaluating the feasibility of Air Force airdrop doctrine is the threat. More than any other factor, the threat in an AirLand Battle is the most difficult and pervasive dimension that must be dealt with by airlift forces. As discussed at various points in this paper, the Army's concentration on the deep attack raises the threat threshold by a quantum leap. Moreover, we are unlikely to enjoy the same degree of air superiority that was achieved in recent wars, particularly the Vietnam War. And instead of facing antiquated and relatively unsophisticated antiaircraft and small arms fire, we will be forced to confront the finest weaponry in the Warsaw Pact

arsenal. These include the tried and proven ZSU 23-4 and the hand-held infrared seeking SA-7 missile, as well as the more modern SAM's in the Soviet inventory.

Theater airlifters are highly vulnerable to fighter aircraft attacks as well. Slow flying and relatively unmaneuverable, the larger airlift aircraft makes a tempting target. Although Red Flag exercises have shown that defensive countermeasures, if properly executed and timed, can be effective against fighters, the airlifter is still a vulnerable target. Given the numerical advantage of the Warsaw Pact in fighter aircraft of all types, we cannot expect to achieve unchallenged air superiority in a European war. In fact, the air defense threat is so high that safe passage of airlifters cannot be assured even when combat air patrol (CAP) and escorts are provided.

How does this high threat environment affect the feasibility of our airdrp doctrine? The answer is, tremendously. Army doctrine calls for concentration and mass, applied at precisely the right time and place. At times, airborne operations may be the most effective, or perhaps the only, way to simultaneously achieve the desired mass and surprise. But mass airdrops mean large formations, particularly if the goal is to maximize the number of airborne paratroopers and amount of combat equipment on the ground in a specified period of time. As the interval

between airdrop aircraft increases, the density of paratroopers hitting the ground necessarily decreases.

Although large formations provide the mass needed for theater surprise and shock, the string of large aircraft presents a highly visible target. One of the most frequently learned lessons at Red Flag is the effectiveness of the single ship aircraft or small formation when making airdrops. Small formations are much more maneuverable, and it is far easier to use the advantage of contour flying and terrain masking. In addition, the first aircraft in a large formation may be able to surprise an antiaircraft battery, but the last few aircraft in the formation are unlikely to slip past the defenders.

This discourse does not mean that large formations should never be flown and mass airdrops should never be made. Quite the contrary; the Army has a legitimate requirement for mass assault operations under the right set of conditions. Also, we learned the hard way in North Africa and Holland during World War Two that airborne operations which lack the necessary mass can be disastrous. (10:22) Grenada is one of our recent successful uses of mass airdrop. (11:2) But the Army and Air Force must jointly recognize the mass airborne operations are viable only in certain situations; even Grenada proved to be very hazardous. (11:2) Certainly, they can be conducted in a benign environment, similar to that

which existed in parts of South Vietnam. It may also be feasible to conduct large formation airdrops in a medium threat environment if sufficient suppression of enemy air defenses has been conducted prior to the operation and fighter escorts are provided in generous numbers. In a high threat environment, many airlift experts believe that losses would be heavy in spite of the level of suppression or number of escorts. (10:26) The decision to employ mass airdrop techniques under these circumstance should be made only after carefully weighing the potential risks against the expected tactical advantage that might be gained.

Regardless of the size of the formation, theater aircraft are particularly vulnerable during the final run-in for an airdrop. During this period of time, lasting from two to ten minutes depending on the tactics employed and th size of the formation, the aircraft must slow down, climb to drop altitude, and maintain a steady course to the DZ. The low airspeed makes it particularly difficult for the aircraft to maneuver or take evasive action. A single ship or small formation can use tactics which minimize the time of exposure and maximize flight path unpredictability during the critical period. But again, large formations have less flexibility and must accept the hazards associated with the airdrop run-in. Good intelligence is particularly important when selecting the run-in route, and fighter escorts to knock out

ground fire and enemy interceptors are imperative. New procedures and better airdrop equipment can reduce some of the risk inherent in the airdrop operation and will be addressed in the next chapter.

Earlier, we noted that Air Force doctrine commits airlift support to the Army "as far forward as necessary" regardless of the level of conflict. Although this attempt to fully meet Army requirements, regardless of how bold these requirements are, is admirable, it presents airlifters with some challenges that must be squarely faced and realistically addressed. And the primary challenge is again the threat, a threat that can be expected to increase substantially as we move from the FLOT to areas deep within the enemy's rear.

There is no doubt that in a medium or high threat environment, such as could be encountered in Europe, today's theater airlifters could not regularly penetrate unaided, deep in enemy territory without unacceptable attrition rates. A substantial amount of defense suppression would normally be required to even make airlift plausible. And several knowledgable authors warn that all the defense suppression in the world will not make the air in central Europe safe enough for sustained airlift operations. (10:26, 21:133) This is a crucial question. If it is not possible to fly deep airlift missions in central Europe, we should tell the Army now because their doctrine counts on it. On the other hand, if

missions in central Europe, we should tell the Army now because their doctrine counts on it. On the other hand, if airlift operations are viable in a medium to high threat environment, we need to determine the limitations and constraints and figure out how to make it work.

The entire AirLand Battle doctrine depends on sustainment during deep attack operations, and that means airlift airdrop requirements. The Air Force owes it to the Army to put our best minds on this matter and give it our most serious thought. With little hesitation, the authors believe it is feasible to provide deep airlift, both airdrop and airland, in a NATO environment. But the airlift support in not without limitations, and it cannot be conducted without outside protection. Before discussing the constraints and limitations, we hasten to add that there may be isolated occasions when enemy defenses are so dense and formidable in the area of operation that airlift is infeasible. However, we believe these situations will be relatively rare even in central Europe; and with the right tactics and sufficient defensive softening, the operation can be conducted with acceptable, although certainly not low, risk in the vast majority of the cases.

Because of the large number of variables, it is nearly impossible to specify in advance the correct employment option, exact tactics, and minimum defensive

measures that should be used in a particular situation. However, some general guidelines can be documented. The COMALF will spend the majority of his time assessing the enemy threat and deciding on the appropriate method to employ his forces.

As discussed earlier in this chapter, mass airdrops and large formations should generally be considered only when the threat is low or can be neutralized with suppression techniques. There may be occasions when the tactical advantage that can be achieved warrants exposing large formations of aircraft to higher threat environments. However, the Air Component Commander and Theater Commander must recognize that large formations provide a multitude of lucrative targets that are severely restricted in conducting defensive maneuvers. As always is the case, the commanders must insure the expected benefits outweigh the risk.

In high threat environments, fighter escorts will nearly always be necessary to augment the defensive tactics. And if necessary, SEAD campaign may proceed the airdrop mission to knock out, at least temporarily, the heaviest enemy threats. The important point is that aerial resupply can nearly always be provided to Army units, even those operating behind enemy lines. However, the cost, both in terms of anticipated attrition and required defensive support, increases exponentially with the threat. Before

establishing an airhead or inserting paratroopers deep in enemy territory, ground commanders must understand that they are placing a heavy burden on air assets, and a large proportion of limited air resources will be required to support the airlift sustainment of that force.

The feasibility of our doctrine according to AFM 2-4; "...as far forward as the requirement demands.", against the current threat is a grey area at best, in the authors' opinions. (15:3) The analysis is probably best summarized by the following: Yes, we can do it, but the price will be extremely high. High attrition rates for the airlift assets, high in the number of CAP, SEAD, and escort forces needed for protection of the airlift resources, or both.

The final factor that we will look at in assessing the feasibility of airlift airdrop doctrine is resources. We have never had a war, nor will we ever have a war, where resources were not limited and did not constrain combat operations. So the question is not "Would we like to have more?", because the answer would be decidedly yes. Rather the question should be "Are the quantity and quality of resources sufficient to make our doctrine feasible and practical or does a different doctrine make more sense in light of hardware shortfalls?"

This question is a vital one from several different perspectives. In the first instance, we must answer the

question affirmatively to insure our doctrine is at least reasonable. For example, the AirLand Battle substantially increases airlift aircraft to threat exposure, and this reality demands a larger fleet size and qualitative upgrades to overcome the threat. Once we determine that our doctrine is reasonable, it should serve as the beacon to guide our force development and modernization programs. That is, doctrine must be more than a mere game plan which sits on a shelf waiting for a war; rather, it is the focus around which all our planning, development, and training revolves.

There are several aspects of the AirLand Battle concept that dictates an increasing number of theater airlift aircraft. These factors have already been discussed in depth in the paper and will only be summarized here. The Army's establishment and increasing reliance on light infantry divisions, for both low intensity conflicts as well as full scale conventional war in a NATO setting, points to additional theater airlift workload. Not only will airlift forces frequently be called on to insert these highly mobile units, but the sustainment effort will require more airlift sorties than for a heavier unit which has more organic capability to sustain itself.

Similarly, the Army's deep attack concept will generate increasing airlift reliance. As the Army extends its logistics lines into enemy territory, ground logistics

become more difficult and tenuous. Airlift will be needed to make up the shortfall. Many units involved in deep operations will undoubtedly rely exclusively on airlift for sustainment.

Finally, this paper has not neglected the fact that deep operations means an increasing threat. This relationship is true in virtually every battlefield environment, but it is particularly true in Central Europe. The higher attrition rate expected in this medium to high threat arena means that we must start with a larger fleet size to meet our sustainment requirements. More importantly, it also means that we must make substantial qualitative improvements to enhance survivability. The existing theater airlift fleet is limited exclusively to low level operations and terrain shielding to avoid ground and air threat. The next chapter will address recommendations for upgrades.

Although the requirement for theater airlift has grown over the past two decades for the reasons cited above, the theater airlift fleet has remained relatively static. The venerable C-130 has been the theater workhorse for over 30 years and a replacement is not yet in sight. General Minter, CINCUSAFE, complains that theater airlift is one of his most critical problems. "The United States Air Force has no organic airlift. We are the airlift experts of the world, and we don't have any airlift to support ourselves." (12:2)

There are a variety of reasons why the theater airlift fleet has not been modernized. First, the C-130 has proven to be a versatile and highly adaptable aircraft. Moreover, we have never faced a crisis in theater airlift capability. Strategic airlift modernization was forced upon the Air Force by the obvious gap in the amount of equipment and number of troops destined for Europe during rapid mobilization and the strategic airlift capacity available to transport them. As mentioned earlier, however, the requirement for theater airlift is more nebulous and difficult to define. Consequently, the need for more and better theater airlift has not captured the attention of our policy makers to the same extent as the strategic airlifter. And the capability of the C-17 to perform the theater role as well as provide strategic airlift, will only prolong the day when theater airlift receives the recognition it needs.

Despite skepticism in some quarters that theater commanders will be willing to use an aircraft as expensive as the C-17 in a theater mode, General Cassidy, CINCMAC, has made it clear that the new aircraft is designed to operate in this environment. (13:8) In fact, the Airlift Master Plan (AMP) recommends retirement of 180 C-130's to make way for the C-17. (14:73) Given the apparent shortfall in existing theater airlift capability and the planned reduction of C-130 forces, we believe that the theater commander will have no

choice but to use the C-17 selectively in a theater role. Moreover, so long as the risk of loss is balanced against the potential gains, it makes perfectly good sense to use the C-17.

Our indorsement of the C-17 in a theater role does not mean that a replacement for the C-130 is not needed. It most surely is. Military Airlift Command recognizes the need for a new theater airlifter as well. In 1985, a MAC study on an advanced tactical transport (ATT) noted the deficiencies and vulnerabilities of the C-130 for modern warfare. (9:16) However, budget constraints have forced MAC to decide between a new strategic and new theater airlifter, and the command correctly selected the C-17. We will recommend in the next chapter that the battle for a C-130 replacement must continue.

Although there is presently no quantitative data to substantiate our claim, the authors do not believe that the Air Force currently has sufficient theater airlift capability to support the AirLand Battle, at least not to the degree the Army envisions. The C-17, once it becomes operational, will alleviate the shortfall. However, the strategic workload will be so heavy, particularly during the initial days of the war, that the C-17 will not fill the theater gap completely. We must either procure more airlift or the Army will have to scale down their AirLand Battle plans to match available

airlift. Right now, we don't think our resources are sufficient to support our apparently unrestricted theater airlift requirement. Since this requirement is as yet unqualified, it may also be a point where Air Force and Army doctrines are inconsistent.

Summary

Both authors feel our doctrine basically reflects historical lessons and is feasible in most areas. However, both authors are concerned about two doctrinal areas after analyzing our airlift airdrop doctrine against historical lessons and feasibility to support the Army's AirLand Battle doctrine: threat and resources. We have not prepared our theater airlift force to face the threat history indicates we will face. Hence, our doctrine is less feasible in support of AirLand Battle doctrine with its reliance on deep attack, which places our vulnerable theater airlift airdrop forces in the most lethal airspace ever known. Likewise, history has proven we could have used more theater airlift resources in every conflict, with the possible exception of Vietnam. Coupled with AirLand Battle doctrine's reliance on deep attacks, the Army's increased use of LIDs and the Air Force's greater strategic airlift delivery capability, all of which point to increased requirements in the future for theater airlift airdrop forces, the indications are clear. Rowan

Scarborough, in an article for Military Forum, makes the same point:

> "First, the Army is changing its AirLand Battle doctrine and may present a more demanding role of Air Force transports. Second, the C-130 has deficiencies for dealing with the battlefield of the future. The Army will likely require tactical airlifter to bring equipment to the forward line of troops (FLOT). This mission would require a highly survivable transport able to defeat ever-improving Soviet defenses." (16:18)

We agree and maintain our current Air Force airlift doctrine does not reflect the historical lessons of airlift shortages and the potential effect of a very lethal threat. Nor does it provide the Army an indication of possible shortfalls in theater airlift resources or threat denial of airlift sustainment. The failure to include either may create a false impression of airlift's ability to fulfill our apparent total support doctrine. Failure to articulate these limitations could possibly be very crucial to the outcome of the AirLand Battle.

CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

Summary and Conclusions

Throughout the history of airpower, the Air Force has learned powerful lessons about the correct way to employ airlift forces. Certainly, many mistakes have been made. "MARKET GARDEN" ignored the principles of mass and surprise and, as a result, failed to achieve its objectives. Similarly, lack of training and use of untested procedures accounted for a miserable performance by American airlift forces at St Mere Eglise during operation "OVERLORD". But there have been some great successes as well. Operation "BITING" and "VARSITY" during World War Two; Sukchon, Sunchon, and Chosin during the Korean War; and Khe Sanh in Vietnam were all airlift success stories because the Army and Air Force adhered to fundamental principles such as mass, maneuver, and surprise. It is imperative that the Armed Forces heed these lessons of history.

As we reviewed the basic doctrines of the Army and Air Force, we concluded that these basic warfighting principles have not only been heeded, they have been meticulously incorporated in the services' doctrinal manuals. The AirLand Battle emphasizes speed, rapid mobility, maneuver, concentration of forces, and surprise. Air Force doctrine

takes advantage of its inherent characteristics of speed, range, and flexibility. These attributes of airlift are key to providing the mass, surprise and maneuver so important to the Army.

Equally important, we further concluded that Army and Air Force doctrine are closely aligned and consistent in their approach to warfighting. The AirLand Battle envisions fighting the next war with a combination of speed, maneuver, initiative and deep operations. This vision necessarily relies heavily on substantial support and close integration with airlift forces. The Army's doctrine would be patently unrealistic and unachievable without a complementary and similarly bold airlift doctrine. And the Air Force has been quick to step up to this challenge. In espousing a capability to support Army forces as far forward in the battlefield as necessary, Air Force doctrine fits perfectly with the most ambitious and challenging feature of the AirLand Battle: the deep attack. Clearly, the Army's doctrine revolves around the extended battlefield, and the Air Force has stood up with unambiguous support.

Even the more controversial aspects of Air Force doctrine, the supremacy of air superiority and centralized control, are consistent with the Army's AirLand Battle. Air superiority is not an end in itself. Rather, control of the air is merely a prerequisite for achieving other objectives.

Until air superiority is achieved, direct Army support functions, such as close air support, airlift and interdiction missions, are infeasible. In like manner, the purpose of centralized control is to provide a more responsive and flexible airpower force with the limited resources available. Without centralized control, airpower cannot be massed to provide the necessary level of support at the decisive time and place.

Finally, we addressed the most difficult, yet revealing, question concerning airlift doctrine. Is it feasible? Can we accomplish what Army doctrine demands of us and what Air Force doctrine says we will do? The answer is a disappointing no, at least not with the assurance of success that we would like. Although the authors recognize that resources and capabilities will always be less than desired, we belive there are shortfalls in three areas: all-weather capability, threat avoidance, and resource deficiencies. The latter two are considered the most serious shortfalls by far.

The AirLand Battle doctrine is a fast paced, dynamic strategy with operations deep inside enemy territory. Consequently, it will be vitally important to provide airlift support to the Army when they need it and regardless of the weather. At present, however, our all-weather airdrop capability is limited to a small percentage of the tactical airlift fleet. And even these aircraft have relative old and

unsophisticated equipment. In short, our all-weather capability is less than optimum, and system deficiencies may cause delays or setbacks in the ground battle.

A war in the European theater against Warsaw Pact forces will pose threats to aerospace forces like none encountered before. And yet, the AirLand Battle, with its deep attack orientation, will place airlift forces into the most dense portions of that threat. Unfortunately, today's theater airlift forces have no internal threat detection or avoidance capability, and there are not enough fighters to provide CAP and escort for every airlift mission. Consequently, it is questionable whether airlift forces can support the Army while maintaining acceptable attrition levels.

Finally, the demand for theater airlift is rising, and will rapidly peak if we go to war, while the number of aircraft is decreasing. There are a number of factors which point to the need for a larger fleet. The increased exposure to threats will create higher attrition rates. Furthermore, the Army's recent emphasis on light infantry divisions tends to increase requested airlift sorties. And finally, supportable ground LOC's quickly disappear for forces engaged in a deep campaign, and this translates to increased reliance on airlift for sustainment of these forces.

Given the size of the existing force and the vintage of the tactical airlift mainstay, the C-130, the authors are doubtful that the airlift fleet is large enough to handle this increased demand. Certainly, the C-17 will help considerably, but the current plan is to decrease the C-130 inventory when the C-17 comes on-board. We believe a shortfall will continue to exist, particularly during the first weeks of the war when the C-17 is preoccupied with intertheater airlift.

For all of these reasons--weather restrictions, threat avoidance limitations, and resource deficiencies--the ability of airlift forces to meet their increasingly challenging doctrinal commitments is marginal at best. This does not mean that the problem is insurmountable; it merely implies that we have bit off more than we can chew at the moment. In light of these conclusions, we will present proposals in the areas of doctrine, tactics, and resources that we believe are prudent measures to enhance the capability of theater airlift.

Recommendations

The Air Force must first make a more realistic doctrinal statement regarding theater airlift. Current doctrine proclaims that airlift can go as far forward as needed, with absolutely no limitations explicitly stated. Although the Army must know this can not be entirely true,

they have every right to rely on this optimistic statement of airlift capability. And a literal reading of FM 100-5 would lead one to believe that the Army has in fact, relied on the Air Force's implied promises when they formulated the AirLand Battle. The authors agree with Colonel Wilke that Air Force doctrine should state that theater airlift "...will provide sustained support as far forward as the threat allows." (1:36) If that support is important enough, a large contingent of tactical air assets or even a major SEAD campaign may be necessary. But, the airlift support in a high threat environment will not come cheaply, and both air and ground commanders need to understand this.

Air Force doctrine also places no restrictions on airlift support as a result of aircraft shortfalls. The presumption is that sustainment from airlift is virtually unlimited, and this is patently untrue. Our doctrinal statement should clarify that shortages of theater and airdrop aircraft will substantially restrict the number of sustainment sorties that can be flown on a continuing basis. The Army must not expect the Air Force to leap in the air the instant they yell "airlift", because it occasionally won't be there. And it's important that ground commanders understand the limitations. Once confessing that airlift assets are limited, TRADOC and MAC should attempt to quantify the impact of the theater airlift shortfall. For example, can existing

airlift resources sustain an armored division for seven days if it becomes isolated from ground supply sources? What is th impact on other expected airlift requirements? There are so many variables and unknowns that these questions are hard to answer, but we should make an attempt.

Secondly, we recommend continued development of new tactical innovations to lower the threat threshold. As discussed previously, the airlifter is most vulnerable while making the final run-in for the airdrop and during the drop itself. At this time, the aircraft must slow to drop airspeed (approximately 130 knots) and climb to drop altitude (600 to 1000 feet AGL). At the higher altitude, the aircraft is distinctly silhouetted against the sky and highly visible from ground perspective, and yet it is still low enough to make an easy target for virtually any weapon system from small arms fire to sophisticated SAM's. The slow airspeed not only gives the enemy an easier target, but it reduces the aircraft's maneuverability as well.

Recognizing this inherent weakness, MAC and TRADOC have addressed the concern as part of their overall airlift requirements study. They proposed tests and equipment modifications which would permit high velocity, low altitude equipment and personnel airdrops. (2:7-1) At present, only the MC-130 is structurally capable of making high speed drops. However, the C-17 design is also compatible with this

capability. We recommend that all C-130 and a calculated proportion of C-141 aircraft (probably 25-50 percent) be structurally modified to accomodate this survivability tactic. High airspeed airdrop capability would substantially increase threat survivability and improve our capability to support the Army in an AirLand Battle environment.

Related to this recommendation, we further propose that increased emphasis be placed on realistic training. We must train the way we intend to fight, and that means each crewmember must be acutely aware of the threat environment and the techniques and tactics to defeat that threat. The watchword in MAC for the past few years has been Combat Aircrew Training (CAT). This is certainly a trend in the right direction, but it is time now to put muscle in the program. Tactics officers at the headquarters and wing levels should develop the optimum combat tactics and techniques, and crewmembers should be evaluated on their ability to apply these tactics during checkrides and ORIs. Since both small and large formation airdrops will be used in the next war, we must develop tactics and train for both techniques.

This proposal implies that more, not less, training is needed; and we are concerned about the downward trend in authorized training time. Although we recognize fiscal

realities, this trend must be reversed and managers must find ways to get more training out of available flying hours.

Our final category of recommendations addresses the shortage and age of the current tactical airlift fleet. We will point to the need for more theater airlift capacity, upgrades on existing aircraft, and development of a new theater airlifter in the near future. We recognize the cost associated with these proposals and the pain they will induce in today's austere climate, but it is time to give theater airlift its rightful place in the priority system. The Air Force must take these steps now or confess to the Army that we cannot fulfill their expectations.

The most important upgrades that we can make on our theater airlift fleet are those that will increase survivability. Up to the present date, MAC has relied exclusively on evasive tactics, such as low level flight and terrain masking, to avoid enemy radar and visual detection. When the threat warranted, fighter escorts and their defensive warning equipment provided an additional degree of protection; but the fighter's mere presence gives away the airlifter's position as well. The theater airlifters must be able to operate autonomously in most situations and need better internal protection capabilities than aerial hide and seek.

We have already discussed structural modifications on C-130's and C-141's to provide a high speed, low altitude airdrop capability. Clearly, pure avoidance of the threat based on intelligence information is the best defense for large aircraft, and the high speed airdrop will enhance our capability in this regard. However, intelligence information can be faulty, and theater airlift aircraft should be equipped with threat detection and avoidance systems, including warning receivers, jammers, chaff, and infrared countermeasures. Combined with improved tactics, more realistic training, and better mutual support techniques with fighter aircraft, this internal defensive suite will provide the degree of calculated protection that is absolutely essential to have any hope of operating in a medium to high threat environment.

As important as these defensive upgrades on the existing fleet are, however, there is only so much you can do with an aircraft 30 years old. We badly need to start development of a new tactical airlift aircraft. For the next few years, the C-17 will understandably drain all of MAC's time, attention, and resources. And the C-17 will ease the burden on the theater airlift mission nearly as much as it does on the intertheater mission. But the time has come for a C-130 follow-on aircraft, and we need to start the process no later than the early 1990's.

With a new theater airlift acquisition, we can incorporate new information and lessons learned over the past 30 years in the areas of Army support requirements, enemy threat systems, defensive technologies, short field capabilities, and aeronautical and computer system developments. Jeffrey Record points out many of the characteristics that would be desirable in this new aircraft. These attributes include short field takeoff and landing performance, high maneuverability, greater speed and range, optimized payload capability and self-contained cargo handling mechanisms. (3: 33-36)

Perhaps the most important design features are those that deal with the threat and improve the probability of survival in a high threat war. Mr. Record indentifies the most promising survivability enhancements as radar signature reduction, radar warning receivers, electronic countermeasures systems, infrared reduction measures, missile warning systems, chaff and flare dispensers, protected fuel systems, and redundant components. (3:27) Of course, the enhanced maneuverability provided by modern flight control technology and structural improvements such as light weight metals and composite materials also contribute immensely to survivability. Finally, improved low level, night, and all-weather capability will add to the overall survivability.

With today's technology and incredible industrial capability, it will be tempting to add more and more features into the design of the new theater airlifter. More and more, that is, until the new aircraft is unaffordable or at least not affordable in the quantities that will be needed. We must focus on those characteristics that will allow us to get the job done and survive in a high threat environment. Everything else is fluff and must be rejected. If the Air Force and industry counterparts design an aircraft that is too expensive to produce in the numbers needed to accomodate high wartime attrition, then we will have failed.

Optimistically, we are probably a decade away from fielding a new tactical airlift aircraft. In the meantime, we need to move toward aircraft upgrades and an increased fleet size. We already recommended equipment upgrades for the C-130 and C-141 to improve survivability. Survivability modifications are not the only one that can be made, of course, but we consider them the most important. Other areas include systems modifications to improve navigation and airdrop accuracy.

To reverse the unquantified, but uncontradicted shortfall in theater airlift capability, we consider it important to increase the intratheater fleet size. The trend over the last decade has been toward increased airlift support requirements, as reflected in the AirLand Battle

doctrine, and decreased airlift aircraft and consequent capability. There are two viable alternatives for solving this dilemma. The first solution is to buy additional C-17 aircraft which would be earmarked for the intratheater mission. These aircraft would be particularly vital during the first 30 days of the war when the remainder of the C-17 fleet and the entire C-141 fleet would be totally saturated with intertheater mobilization.

Alternatively, the Air Force could maintain the entire C-130 fleet in the inventory for the foreseeable future, rather than pursuing the planned phase out of 180 C-130's (over one third of the fleet) when the C-17 comes on-board. Although the AMP expects the C-17 to pickup that portion of the intratheater mission dropped by the 180 retired C-130's, we believe it is more prudent to use these aircraft to fill the existing gap. As pointed out continuously throughout this paper, the AirLand Battle will demand a huge amount of airlift, more than ever considered in prior wars, and there is ample reason to suspect that these requirements have been underestimated.

Regardless of which alternative is selected, if either one, we will need a mix of C-17's and C-130's to accomplish the intratheater mission effectively. The C-17 is most efficient when direct delivery techniques are feasible or

large payloads are needed. The C-130 is best suited for lighter payloads over smaller distances.

Finally, we recommend expeditious completion of the WIMS and its quantification of the theater airlift requirement. This quantification is a difficult, but necessary, exercise. There are many variables that are difficult to quantify, and as a result, precision is not likely to be achieved. Nonetheless, we must make an initial estimate of the theater airlift requirement. The numbers and models can be upgraded as we learn more about the dynamics involved from actual contingencies and exercises. Once calculated, the requirement for theater airlift will give us a rough estimate of the number of airlift aircraft needed in a European war. We should keep in mind, however, that past estimates have always been low, and there is little reason to believe that modern estimaters have been suddenly struck by divine inspiration.

The Air Force presently has the best strategic weapons, the most advanced fighter aircraft, the finest and best trained Army, and will soon have by far the most capable strategic airlift aircraft in the world. And this is as it should be. But history has also taught us that responsive and effective intratheater airlift is absolutely essential for the conduct of successful ground warfare. The time has come to give the proper attention to that lesson. The C-17,

although adding considerably to intratheater capability, cannot fill both the inter and intratheater gaps by itself. We call for renewed attention on theater airlift. Let us upgrade the existing fleet first, and begin development of a new airlifter within the next five years. Our future depends on it.

GLOSSSARY

ACRA	Airlift Concepts and Requirements Agency
AFM	Air Force Manual
AGL	Above Ground Level
AI	Air Interdiction
ALB	AirLand Battle
AMP	Airlift Master Plan
ATT	Advanced Tactical Transport
AWADS	Adverse Weather Aerial Delivery System
BAI	Battlefield Air Interdiction
CAP	Combat Air Patrol
CAS	Close Air Support
CAT	Combat Aircrew Training
CCT	Combat Control Team
CDS	Container Delivery System
CINC	Commander in Chief
COMALF	Commander of Airlift Forces
DZ	Drop Zone
ETO	European Theater of Operations
FEAFCCC	Far Eastern Air Force Combat Cargo Commamd
FEBA	Forward Edge of the Battle Area
FLOT	Forward Line of Own Troops
FM	Field Manual (US Army)
GPES	Ground Proximity Extraction System
GRADS	Ground Radar Aerial Delivery System

HALO	High Altitude Low Opening
IMC	Instrument Meterological Conditions
J-SAK	Joint Attack of the Second Echelon
JA/ATT	Joint Airborne/Air Transportability Training
LAPES	Low Altitude Parachute Extraction System
LOC	Line of Communication
MAC	Military Airlift Command
MAS	Military Airlift Squadron
MAW	Military Airlift Wing
NATO	North Atlantic Treaty Organization
ORI	Operational Readiness Inspection
PINS	Palletized Inertial Navigation System
POL	Petrol, Oil, Lubricants
QITARS	Qualitative Intratheater Airlift Requirement Study
RAF	Royal Air Force
SAM	Surface to Air Missile
SCNS	Self Contained Navigation System
SEAD	Suppression of Enemy Air Defense
SKE	Station Keeping Equipment
SOF	Special Operations Forces
TAS	Tactical Airlift Squadron
TAW	Tactical Airlift Wing
TCG	Troop Carrier Group
TCS	Troop Carrier Squadron

TCW	Troop Carrier Wing
TRADOC	Training and Doctrine Command
US	United States
USAAF	United States Army Air Forces
USAF	United States Air Force
USAFE	United States Air Forces Europe
USSOC	United States Special Operations Command
USSR	Union of Soviet Socialist Republics
VNAF	South Vietnamese Air Force
WIMS	Worldwide Intratheater Mobility Study

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