Force Design, the Airmobile Concept and Operational Art

A MONOGRAPH

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ABSTRACT

FORCE DESIGN, THE AIRMOBILE CONCEPT AND OPERATIONAL ART by MAJ Francis J. Huber, SC, 39 pages.

Force Design is the process of designing the organization of army units. The process involves building unit structures, including combat support and combat service support capabilities, and then validating those structures through testing and analysis. Historically the criteria for validating and testing those structures have focused on the tactical effectiveness of the unit.

This monograph evaluates the design process to determine if it is capable of producing units oriented on operational effects. An organization designed to serve as an operational unit must have different competencies and capabilities from a unit that is a purely tactical formation. In order for the design process to produce a unit competent as an operationally oriented force the evaluation process must have an understanding of operational art and the characteristics of forces intended to support operational art.

The 1962 Tactical Mobility Requirements Board, also known as the Howze Board, provides an instructive historical case study of the force design process. The Howze board was unique in that it was given the opportunity to design an entirely new formation, the Air Assault Division, to produce a new kind of effect on the battlefield. The Howze board also illustrates the current design process in that computer simulations and live field trials validated the decisions of the board. Finally, the validity of these results can be examined by looking at the operations of the 1st Cavalry Division (Airmobile)in the Pleiku campaign of 1965.

This case study concludes that the elements of the force design process can be adapted to evaluate the operational effectiveness of a unit. To achieve this result the designers and evaluators must change their mental model of the test criteria. This will require test designers who understand operational employment and can design tests and criteria that support that understanding.

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I. Introduction

This monograph examines a modern situation where a unit designed to meet a tactical goal is able to produce an operational effect. The specific case utilized in the context is the 1962 Tactical Mobility Requirements Board, more popularly known as the "Howze Board." The purpose is to examine the U.S. Army's organizational design process and determine if it was effective in designing units capable of producing operational effects. The ability of the design process to produce a unit capable of obtaining operational objectives is dependent on the designer's understanding of the operational level of war and how it relates to operational art.

Because operational art is primarily a cognitive process rather than a mechanical process, the interaction of the intellect with the physical is paramount to its understanding.[1] It is necessary to study not only the mechanical force design process, but the personalities and concepts that influence the process. This study is about General James Gavin, General Hamilton H. Howze, Major General Harry W. O. Kinnard, and the other pioneers in the air cavalry concept and how they would shape the Air Assault Division. The study is also about the computer modeling and simulation or the mechanical process employed by the Howze board in testing their concept. Elements of the design

process must be examined to determine how effective the shaping was.

The Howze board had to make a large number of decisions that would affect the shape of the organizations that would occur. These decisions would be influenced by the boards understanding of the purpose of the unit and the nature of modern warfare. To understand the outcome of the process it is important to understand what decisions were made by the board since these decisions form the foundation of the design process.

Once the design process is completed it is necessary to test the design and ensure that it is correct and meets the intent of the original concept. The 11th Air Assault Division (Test) was created to test the framework laid down in the Howze board report for an Air Assault Division. This organization was evaluated during two major exercises, Air Assault I and II, to determine if the design goals were met. The results of a test are a function of the test criteria. It is important to understand what was being tested during these exercises and how the test director and evaluators measured the results.

Criteria for evaluating operational effectiveness should focus on measuring the operational level results of the unit as opposed to tactical outcomes. Operational effects can be

studied and measured when they are understood and evaluated concerning the concept of operational art.

II. Operational Art and Force Design

The concept of the "operational level of war" and "operational art" is relatively modern, only recently entering the lexicon of the United States Army. The United States Armed Forces define the operational level of war as:

> The level of war at which campaigns and major operations are planned, conducted, and sustained to accomplish strategic objectives within theaters or areas of operations. Activities at this level link tactics and strategy by establishing operational objectives needed to accomplish the strategic objectives, sequencing events to achieve the operational objectives, initiating actions, and applying resources to bring about and sustain these events. These activities imply a broader dimension of time or space than do tactics; they ensure the logistic and administrative support of tactical forces, and provide the means by which tactical successes are exploited to achieve strategic objectives.[2]

The need to create a bridge between tactics and strategy came about as a result of the mass armies of the nineteenth and twentieth centuries.[3] As these armies grew in size they also began to grow in both space and resiliency. No longer could a single commander see the entire battlefield, and no longer would an army be destroyed in a single battle or engagement.[4] As successful commanders recognized the emergence of the new level of war they understood the need for new kinds of organizations to produce operational effects. While the Army definition describes operational

art, it is not useful as an evaluation tool. It is important to understand the attributes of an operational action in establishing effective evaluation criteria.

Operational art implies attack on an adversary's system to achieve "Operational Shock." Operational shock requires actions to be taken with "depth, continuity, synergism and wholeness" that would produce an effect that was greater than the sum of the tactical actions of the formation.[5] To achieve this the shock army must have specific characteristics. It must have sufficient penetrating power to achieve a breakthrough of the enemies main defensive line. The formation must have sufficient strength and logistics to achieve an operational depth with sufficient combat capability at that depth to produce a shock effect.[6] Early Soviet theorists envisioned an operational unit or "shock army" as being a grouping of units above a corps.[7] This was necessary to retain sufficient combat power after achieving the costly tactical penetration.

In a more modern context the focus is not on the size of the unit, but the nature of the warlike act being performed. For a tactical action to have operational effects it should reflect the cognitive tension between strategic aim and tactical missions. Actions are based upon industrious maneuver, and synergetic in that the whole is greater than the sum of the tactical actions. The operation should focus

towards disruption of the opponent's systems, be non-linear in nature, hierarchically structured in depth, and constitute an independent entity.[8] During the Second World War different formations would be designed by both sides to achieve operational level effects. A promising operational formation was the Airborne Division.

The potential of the airborne division seemed to produce great enthusiasm among the army leadership. Many of the pioneers of the air assault division would come from the "Airborne Club" including Lieutenant General James Gavin. General Gavin's experiences with airborne units in the war would provide much needed support for Army Aviation.

III. The Context for the Howze Board

The desire that drove changes in army aviation came as an effort to resolve a long standing tension between the "ground" army and the Army Air Corps (later the U.S. Air Force). At this time there was not a professional recognition of operational art in the U.S. Army. The ground army recognized the advantages of tactical aviation and employed artillery spotting and command and control light aircraft as early as the Louisiana maneuvers in the late 1930's.[9] This was accomplished using civilian planes and pilots, thus setting a precedent for a "work around" to Air Corps Intransigence. In the summer of 1941 the Army purchased the first twenty L4 light aircraft. Intentionally

routing the purchase request through LTG Leslie J. McNair's deputy while LTG McNair was out of Washington D.C. to bypass Army Air Corps resistance.[10] Throughout World War II a running bureaucratic war would exist in the War Department over the Army's use of organic aircraft, and the organization and employment of tactical support aircraft. At the close of the war the advent of the atomic bomb significantly altered the balance of bureaucratic power.

Following the Second World War the Army appeared to be in a losing position as the preeminence of the atomic bomb and the Strategic Air Command made the ground army seem anachronistic and obsolete. However, the war in Korea presented a situation where strategic bombing was relatively ineffective, and the need for air support to army ground units reemerged as an issue. At this time the Army also began its first extensive use of the helicopter in combat. Over 21,000 casualties were airlifted, General Maxwell Taylor used helicopter resupply to save an important flank, and Lieutenant General Rueben Jenkins used a helicopter for airborne command and control. The Marine Corps also experimented with airlifting combat units using helicopters.[11] Considering these positive experiences a school of disciples of army aviation began to form. Army aviators advocated the need of the army to have its' form of aviation, and especially for the need for rotary wing

aviation. These disciples worked to convert a wide audience to their view on army aviation.

At the same time many general officers who were veterans of the Second World War and Korea began to show a marked interest in aviation. They were inspired by the practical application of aviation in Korea and their hopes for the "airborne idea". One of these officers was Hamilton H. Howze.

General Howze began his career in the Cavalry before World War II and was a successful armor battalion commander in the Second World War. In 1949, then Colonel, Howze attended Airborne School at the age of forty-three.[12] This would be the beginning of his long association with airborne units. He served as an Assistant Division Commander of the 2nd Armored Division in Germany. In 1956 as a Major General he was assigned to the U.S. Army G-3 staff as Chief of Army Aviation.

In the position of Chief of Army Aviation Major General Howze learned to fly by arranging for personal lessons at Davidson Army Airfield at Fort Belvoir Virginia.[13] He would cherish his aviator status throughout the rest of his military career and into his civilian career. In his position as Chief of Army Aviation he was able to push through some actions that would later bear great benefits to the army aviation community as a whole. One of the most

controversial was that he helped obtain an exception to the roles and missions agreements with the Airforce that allowed the Army to purchase the De Havilland Caribou and the Grumman Mohawk.[14] However, he also devoted much time to functions outside the walls of the Pentagon.

Major General Howze considered it very important that the Army as a corporate body believe in the importance of army aviation. To help reinforce this he developed a traveling road show that pitched the benefits of army aviation to the Command and General Staff College, every combat arms school, offices in the pentagon, and anyone else who would listen to his message.[15] The Army Aviation staff was not the only body actively pursuing the goal of an expanded role for army aviation.

Other activities were occurring at the same time that bore fruit during the Howze board. The Grumman Mohawk was built with arming attachment points to meet Marine Corps requirements even though the Marines would later withdraw from the project. Also about this time the Bell H-40 (later the UH-1) was under development with design goals of being able to lift a rifle squad and fit inside a C-130.[16] It would be the first army helicopter equipped with a turbine engine to meet the design goals of improved lift and reduced maintenance.

Perhaps the most important research was conducted by the Army Aviation test board at FT Rucker, Alabama which quietly began tests on arming helicopters in the late 1950's. Interestingly, official literature concurrently being published by Major General Howze made no reference to armed helicopters.[17] Colonel J. D. Vanderpool was assigned to test armed helicopters with the goal of designing units that would perform the functions of the old horse cavalry units of the pre Second World War days. Many pages of the test board's writings were lifted verbatim from the last field manual written for horse cavalry in 1936.[18] Later this concept would resonate very well with the old Cavalryman, Hamilton H. Howze.

From 1957-1959 Major General Howze commanded the 82nd Airborne Division, and though he was not officially in the aviation community during this time he continued his interest both in flying and army aviation. He would personally pilot a helicopter to inspect units of his division.[19] He would maintain an involvement with the aviation community in spite of the demands of division command.

In 1960 the Army convened what became known as the Rogers Board to study Army Aviation. The board mostly made technical recommendations concerning aviation. The board did recommend the creation of an "Air Cavalry unit" to

maximize the mobility potential of the helicopter.[20] The Rogers Board was extremely conservative and cut its recommendations for the number of aircraft required by the Army.

The Rogers board in reducing its aircraft request reflected the mindset of an army playing second fiddle to the Strategic Air Command. With the Presidential election of 1960 the playing field began to change.[21] In 1961 President John Fitzgerald Kennedy was inaugurated as President of the United States. He immediately began to show an interest in unconventional warfare. He also appointed the efficiency minded Robert S. McNamara as his Secretary of Defense. In October of 1961 Secretary McNamara conducted a meeting with the Vice Chief of Staff of the Army and Brigadier General Von Kann, director of Army Aviation. On 5 October he sent a memo to the Secretary of the Army Requesting a study of Army Aviation requirements.[22] The Secretary of the Army essentially repackaged the Rogers Board's recommendations and responded to Secretary McNamara on 1 November 1961. The office of the Secretary of Defense performed some analysis on the packages and they were presented to Secretary McNamara in April of 1962.

Secretary McNamara was displeased with the conservative recommendations of the Rogers Board. He wrote two memorandums to the Secretary of the Army directing the Army

to restudy its requirements. He specifically stated that the ". . . proposed increased buy of Army Aircraft for 1964 and on the position that your predicted requirements in this area through 1970 are too low."[23] He went on to direct ". . . the army to completely re-examine its quantitative and qualitative requirements for aviation." The deadline for completing this study was 1 September 1962.[24]

Apparently Secretary McNamara was concerned that he had not been directive enough. He immediately issued a second directive specifying details as a suggested board composition and the commands and agencies that would support the board's work. He concluded this memorandum with the statement that "I shall be disappointed if the Army's re-examination merely produces logistics-oriented recommendations to procure more of the same, rather than a plan for implementing fresh and perhaps unorthodox concepts which will give us a significant increase in mobility."[25]

The Memorandum specifically directed that the board include Lieutenant General Hamilton H. Howze as a member of the board, and as the senior member he became the president of the board. Lieutenant General Howze was then serving as Commander of the XVIII Airborne Corps at Fort Bragg North Carolina. On 3 May 1962 the Commander of the Continental Army Command (CONARC), General Herbert Powell, published the directive for creation of the board and directed that its

work be completed by 20 August. Lieutenant General Howze then discovered that to print the report by 20 August it would have to be ready for publication by 1 August.[26]

IV. The Howze Board

Lieutenant General Howze immediately set to work with great enthusiasm. He took over a newly completed elementary school on Fort Bragg and used it as a facility for the board's operations.[27] He then worked to include every army agency and office that might be affected, more to increase army ownership of the board's findings than for any practicable contribution.[28]

The board employed logisticians to investigate matters including theater logistics, airfield construction criteria, fuel distribution, efficiency and vulnerability of air lines of communications and logistics planning factors.[29] This analysis would involve the use of both manual estimation and computer simulations.

A critical portion of the analysis was computer wargames conducted by the Research Analysis Corporation and Technical Operations Incorporated. These war games utilized a scenario with an airmobile unit defending in Iran in the Zargos mountains against a Soviet invasion. The wargames provided two important results favorable to the air assault division concept. The strategic deployability of the air assault division allowed it to arrive ahead of conventional

forces. It then would delay the first echelons of the invading force to buy time for the "heavy" forces to arrive. Secondly, the tactical mobility of the air assault division enabled it to operate logistically on interior lines even when the geometry did not appear to support that. When a logistics base or command center was threatened it could be moved to prevent disruption of logistics support or command and control.[30] Since computer simulation was new at this time it would be necessary to validate the simulation results through field trials.

The Howze board utilized detailed units of the 82nd Airborne Division and borrowed helicopters to test tactics, procedures and logistics of air operations. These tests were not really tests in a scientific sense, but field trials of different techniques and procedures.[31] These tests persuaded Lieutenant General Howze that he had the right idea. However, there was not a rigorous program of instrumentation to ensure that complete data was collected or analyzed, nor testing of alternative techniques to ensure that procedures were optimized.[32] Each trial was conducted as a single event and little emphasis was placed on gauging the effects of attrition over time.

Importantly all the simulations and exercises involved single battles or scenarios. None of the exercises studied the employment of air assault units over the course of a

campaign. There was no rigorous logic for how those units should be employed nor what the right force mix was. [33] One simulation was conducted in a theater scenario, but the purpose of the simulation was to determine if an air assault division could be effective in a theater of operations. The simulation did not attempt to address how many divisions were needed for optimum effectiveness. The board made recommendations creating Air Assault units without justifying the numbers.

The board's final report contained recommendations for air assault divisions, air cavalry brigades and air transport brigades.[34] In the end only the air assault division was ever fielded, and Lieutenant General Howze felt that the failure to field an air cavalry brigade was a significant mistake.[35] It is interesting also to note that when Secretary McNamara viewed one of the Howze board tests his specific concern was the cost efficiency of the unit.[36] The boards final report would contain cost data and would propose some specific conventional system deletions to pay for the new units. The primary thrust of the report would be that the increase in effectiveness of the new units would make them more cost efficient than less expensive conventional units.[37]

In spite of the extremely compressed schedule for the board's work and the ad hoc nature of the testing much of

the work later withstood the test of combat. The organization of the air assault aviation was designed by Brigadier General Von Kann and Lieutenant General Howze. Minus the armed Mohawks this would be the organization that the 1st Cavalry Division (Airmobile) would utilize in the jungles of Vietnam.

V. The 11th Air Assault Division (test)

Lieutenant General Howze recommended that the 82nd Airborne Division be converted to an air assault division to continue the work begun by the Howze board. Instead Secretary McNamara authorized an increase in the Army end strength for Fiscal year 1964 from 960,000 to 975,000 to create the 11th Air Assault Division (test).[38] The order for the activation of the 11th Air Assault Division was issued on 7 January 1963.[39]

Brigadier General Harry W. O. Kinnard was selected to command the newly created division, which stood up at Fort Benning Georgia. To create a new division from the ground up and complete all the testing that was being asked of them was a monumental task, but the challenge and the free rein for innovation given to the members of the new unit inspired them to rise to the occasion.[40]

The 11th Air Assault Division was a new table of organization and equipment (TO&E) and a new concept in warfighting. The test directors found it extremely

difficult to know what to test as unit compositions and tactics could change from one day to the next independent of test results. Since many of the tactics and procedures were new the testers had to identify whether a failure was due to procedural, systemic or training deficiencies.[41]

The test directors were also aware that one of the challenges of testing this new unit was that it was not a new design intended to fight according to existing doctrine. The unit was intended to fight in a new way, conducting a series of engagements with little time between fights, to keep the opponent "off balance."[42]

Much of the testing focused on tactical scenarios and the ability to employ the unit in a tactical engagement. Yet, the commander was concerned about matters that would impact on its ability to perform as a unit designed to achieve results at the operational level of war. The Howze board tests already identified that maintenance and supply facilities would require drastic changes to keep up with a fast moving battle.[43] Further the Division commander, Major General Harry Kinnard, was concerned about the ability to command, control and logistically support dispersed units without ground lines of communications as fuel and ammunition consumption increased.[44] To investigate some of these concerns the early evaluations considered five broad areas for the test. The areas were: reconnaissance and

security, mobility, combat support, combat service support and control and communications.[45]

The test scenarios as they were designed were essentially a series of tactical actions. However, the test scenarios did support operations over extended distances. During one of the tests units were air assaulted from Vidalia Georgia to Fort Stewart Georgia in a series of simulated counterinsurgency and conventional exercises.[46]

During these tests some of the unique advantages of the Air Mobile concept were effectively demonstrated. The advantage of avoiding the costly penetration phase to conduct a deep attack was recognized. A great deal of emphasis was placed on locating the enemy so that elements could be separated and attacked in detail. Also a great deal of attention was given to establishing hasty air strips so that the larger CV-2 caribou aircraft could land and increase logistics sustainability.[47]

The final test for the 11th Air Assault Division took place from 14 October to 12 November 1964. This test involved some 35,000 personnel and covered over four million acres through the Carolinas. The 82nd Airborne Division acted as the aggressor force. The 11th Air Assault had become so enthusiastic about their ability to attack in multiple locations simultaneously that the evaluators were

challenged to get to all the locations on time to collect needed data without impairing the exercise.[48]

While some observers were still concerned over issues such as the vulnerability of the helicopter to ground fire other observers were much less reserved in their enthusiasm for the concept. Major General Kinnard, the Division Commander believed that ". . . it [the division] can also operate with devastating effect against the rear of the enemy."[49] The final report of the test director, Lieutenant General C. W. G. Rich, made important observations and recommendations. First, the 11th Air Assault structure should be retained within the army force. Second, the advantages of the mobility gained by the 11th Air Assault were most apparent when employed in conjunction with conventional ROAD (Reorganization Objective Army Division) divisions. Finally, unique capabilities of an air assault unit were gained by having a special unit that was organized, trained, equipped and led specifically to fight as an air assault division.[50]

VI. The 1st Cavalry Division (Airmobile)

American helicopters had been operating in the Republic of Vietnam since December 1961.[51] In 1962 the first UH-1's arrived with the 57th Medical Detachment (Helicopter Ambulance). This was quickly followed by the 23d Special

Warfare Aviation Detachment with OV-1 Mohawks to provide reconnaissance and photographic coverage.[52]

In 1965, the decision was made to begin committing U.S. Army ground combat units to the conflict in Vietnam. The immediate question became which units were best suited to what was viewed as a counter insurgency campaign in the jungles of Vietnam. As a unit was being selected the 11th Air Assault completed its testing and was in limbo at Fort Benning Georgia. The Vice Chief of Staff of the Army, General Creighton W. Abrams was quoted as stating "Is it not fortuitous that we happen to have this organization in existence at this point in time?"

On 1 July 1965, the 1st Cavalry Division (Airmobile) activated at Ft. Benning with its colors hastily flown from Korea while the colors of the 2nd Infantry Division were rushed to Korea from Ft. Benning to take their place. The 1st Cavalry division was given four weeks to achieve readiness for combat. At the end of the four weeks, on July 28, the President of the United States, Lyndon Johnson, announced that the 1st Cavalry Division was being ordered to Vietnam.[53] Some significant changes were made to the Division's structure. The Division lost all of its armed OV-1 Mohawks, retaining only six unarmed Mohawks for reconnaissance and surveillance.[54] Also, the 1st Brigade, 1st

Cavalry, was designated as an airborne brigade and had to conduct airborne training as well as air assault training.[55]

In spite of these challenges the Division moved over 15,000 men and 434 helicopters and aircraft to South Vietnam and established their first base at An Khe and prepared to enter combat.[56] During the period of 23 October to 28 November the Division would fight what later became known as the Pleiku campaign.

The Pleiku campaign would answer many of the critics of the Airmobile concept. It would demonstrate that an air mechanized unit was capable of conducting the kind of operations required to achieve operational level effects. The campaign began on 23 October with the division ordered to deploy to assist a Special Forces outpost at Plei Me.[57] The reconnaissance capability of the air cavalry squadron enabled the Division to recognize that they were faced with more than a small assault on an isolated outpost. The Division turned from defending Plei Me to locating and attacking elements of the North Vietnamese Army. Utilizing their ability to locate and quickly attack enemy formations the 1st Cavalry Division was soon engaged in the epic battle of the Ia Drang Valley. During the campaign aircraft delivered 5,048 tons of cargo directly to the soldiers in the field, concurrently moving 2700 refugees to safety. The North Vietnamese were forced to withdraw and change their

strategy and tactics. This was achieved at a price of 59 aircraft hit by enemy fire, three while on the ground, four shot down and three of the four recovered.[58]

The North Vietnamese became more effective with ground fire in later campaigns. They were never able to stop airmobile operations that were supported properly with good intelligence preparation and a proper escort of armed helicopters.[59] Further, the North Vietnamese Army was forced to halt its offensive and reconsider its strategy.

VII. Operational Art and Pleiku

The question of whether "Operational" level results were achieved using the airmobile concept remains unanswered. To answer that question the evaluation criteria from Section II, Operational Art and Force Design, will be used.

The first criterion was that the warlike act "reflect the cognitive tension between strategic aim and tactical missions." This tension derives from the need for tactical actions to link to the strategic aim. The strategic aim is expressed as an abstract concept, such as "a secure and stable Republic of Vietnam," while the tactical missions must be concrete actions assigned to tactical units, such as "defeat" or "destroy". The art, or cognition, in maintaining the linkage reflects the tension between the abstract and the concrete. This tension manifested itself in

the tactical missions executed by the 1st Cavalry Division during the Pleiku campaign.

The Pleiku campaign and the 1st Cavalry Divisions actions in Vietnam represent this cognitive tension manifested in a limited warfare situation. The stated tactical mission of the 1st Cavalry Division was to seek and destroy the enemy. Yet, during this operation they also airlifted 2700 refugees and relieved the Plei Me Civilian Indigent Defense Group (CIDG) base camp. These tactical actions appear to be contradictory in nature. The civil missions detract from the unit's ability to complete the destruction of the enemy. However, both of these actions are necessary to achieve the abstract strategic aim. Without this linkage the maintenance of the strategic aim is impossible. The division's ability to pursue simultaneous, diverse tactical missions which support the strategic aim demonstrates an ability to reflect this cognitive tension.

The next measure is that it be, "based upon industrious maneuver."[60] The concept of industrious maneuver is related to the idea of operational shock. To achieve operational shock tactical actions must have certain attributes. First there must be a "fixing force" that keeps the opponent's forces "fixed" to their positions. Then there must be a "shock force" that attacks rapidly, at an operational depth, in multiple engagements fought either simultaneously or near

simultaneously. This shock force should cause the enemy to be unable to respond effectively because he has more tactical problems than he can deal with in the time and space in which they occur.

Industrious maneuver is where the Airmobile concept truly shows its uniqueness. The enemy (NVA) front commander was unable to conduct operations as he expected because he had to deal simultaneously with two armies. The conventional Army of the Republic of Vietnam served in a role of a fixing force, and the 1st Cavalry Division served the function of an operational "shock army." The ability of the helicopter based unit to find and quickly assault elements of the enemy's forces left the enemy unable to form a coherent reaction and respond effectively. This is a classic use of industrious maneuver to produce operational effects.

To demonstrate the operational effect the "overall result should be synergetic in that the whole is greater than the sum of the tactical actions." The Pleiku campaign clearly demonstrates this. While the losses inflicted on the North Vietnamese forces were substantial they did not in themselves force the NVA to withdraw, regroup and rethink their tactics. It was the inability of the NVA to respond effectively to the airmobile threat and achieve their aim that caused the enemy to withdraw from the contested area.

Had the same losses been inflicted in a fight at the time and places chosen by the North Vietnamese they could have continued their campaign to gain control of the region.

The "operation should aim towards disruption of its opponents system" is another strength of the Airmobile concept. The operation must focus its tactical actions on disrupting the enemy's ability to react by attacking him throughout the depth of his system. The specific target at the battle of Landing Zone x-ray was the disruption of the NVA's supply and command and control structures, not the logistics base that was discovered. This disruption meant that NVA counterattacks were ineffective as they were poorly coordinated and poorly supported. The fluid nature of the campaign made it difficult for the enemy to react to the constantly changing situation.

The Pleiku campaign was "non-linear" from beginning to end. There were never establish battle lines. This left the enemy off balance and unable to anticipate the movements of the Airmobile units. An engagement could suddenly materialize anywhere a UH-1 could land and in some places where they could not. The tactical units could fight a 360 degree perimeter when required and air rocket artillery and airlifted artillery could provide fire support on demand. More importantly, units could quickly shift from the base at

An Khe directly into battle or even shift from one fight to another if required.

A unit must "be able to fight throughout the depth of the enemy to achieve disruption." The 1st Cavalry Division was able to attack the NVA wherever they could locate them within the Republic of Vietnam. They could not fight throughout the depth of the enemy due to the political restrictions of a limited war. The Division was unable to follow the retreating forces into Cambodia. This restriction was necessary at the time to maintain the strategic aim of preventing the spread of the war beyond the borders of Vietnam. Had the division done otherwise the linkage between the strategic aim and tactical actions would have broken, thus destroying the operational effectiveness of the unit. This linkage to the whole was maintained even as the unit reacted to opportunities on its own initiative.

Finally, the unit must "constitute an independent entity." Here again the 1st Cavalry Division displayed its strengths as a capable operational force. Using its organic Mohawks and the air cavalry squadron the unit could locate enemy concentrations, develop the intelligence picture and attack the enemy without utilizing external assets. The 1st Cavalry Division contained all the necessary logistics and command and control assets to permit the unit to conduct sustained, independent operations. The division did utilize

extensive fire support from the Air Force, but this does not in any way reduce the independence of the actions taken by the 1st Cavalry Division in the Pleiku campaign.

The Pleiku campaign clearly meets the requirements for operational level actions. Later engagements by air assault divisions in Vietnam would not always demonstrate this clear operational level element. This evolved from a failure to maintain a linkage between the tactical actions of the unit and the strategy in Vietnam rather than the unit's lack of capability. The airmobile division demonstrated that it had all the necessary elements of combat power to conduct operational missions.

VIII. Implications for Force Design

Force design is the process of building units. It involves not only assembling the combat equipment and personnel, but all the elements that go into creating the unit's combat power. Combat power includes combat support and combat service support capabilities.[61] Combat power also consists of the equipment (technology) and the organizational design (concept) of employment.

The design of the 11th Air Assault Division provides an interesting case study of the interaction between concepts and technology. The aircraft systems utilized in the 11th Air Assault would in many ways drive the design of the

organization and define the parameters of its capabilities and limitations.

The most important technology in the Division was the UH-1 helicopter. The UH-1's technology was revolutionary in comparison to previous helicopters. It was one of the first helicopters to be developed around the turbine engine. This provided both greater lift and reduced maintenance. Reducing maintenance was essential to reduce the logistical footprint of the air assault division. The stated goal was to achieve one hour of maintenance for each hour of flight. In Vietnam, experience indicated it was about ten hours of maintenance for each hour of flight time.[62]

Aircraft maintenance would prove to be one of the key limiting factors of the air assault division. The Howze board designed the division with an "A-B-C" maintenance concept where maintenance would be performed as far forward as possible to permit the helicopters to stay close to their supported units. For the 1st Cavalry Division this did not happen in 1965 because of a shortage of maintenance personnel. All helicopters had to fly out of the base at An Khe so that maintenance could be centralized, reducing the number of maintenance personnel required.[63] To support the higher levels of maintenance for helicopters in Vietnam a unique approach was taken. An old seaplane tender, the USS Albermarle, was renamed the USNS Corpus Christi Bay and

converted to a depot maintenance facility. It was then sailed to Cam Ranh Bay where it would perform this function for the remainder of the US involvement in Vietnam.[64]

Maintenance was not the only impact of the UH-1 on the organization. When the UH-1 was originally designed it had a goal of being able to carry an entire rifle squad. This goal was never met.[65] In spite of this there is no surviving evidence that the Howze board ever seriously considered changing the size of the rifle squad to accommodate the aircraft. It can be presumed that, based on the collective combat experience of the senior officers who made up the Howze board, they felt the current structure of the squad and platoon should be left unchanged to achieve tactical effectiveness once on the ground.

Most of the Division structure was essentially copied from the current army ROAD Divisions.[66] The infantry battalions were designed with a headquarters company, combat support company and three rifle companies. The combat support company contained a ground surveillance and reconnaissance platoon and a mortar platoon. The rifle company had three rifle platoons of three rifle squads and a weapons squad. This structure was used in the old triangular division of the second world war.[67]

Another technology that was critical to the design of the air assault division was the armed helicopter. The

arming of army aircraft had been a long standing dispute with the air force as a component of the roles and missions controversy. By 1963 the armed helicopter was accepted as a reality.[68] The UH-1A had been constructed without mounting points for weapons, but all subsequent models were constructed with mounting points.[69] A variety of weapons were tried on the UH-1's, in one test a UH-1B was even fitted with a Vulcan electric gattling gun.[70] The successful ones were machine guns, 2.75 inch rockets and SS-11 anti-tank missiles. The purpose of the armed helicopters was twofold. The armed helicopters would provide suppressive fire along the ingress route and would move slightly ahead of the troop carrying helicopters and "prep" the objective before the landing of the assault element. After preparatory fires the armed UH-1B's would orbit and serve as an "on call" aerial rocket artillery until ground based artillery could be established.[71]

The air assault division was also to be equipped with the HC-1B (later CH-47) Chinook when they became available. The Chinook was intended to be able to take cargo directly from the Caribou aircraft and transfer it to landing zones where a runway had not yet been established.[72] The Chinook was touted as having the same internal cargo space and the same lifting capacity as the Caribou.[73] Experience in Vietnam was that the Chinook was so valuable as a cargo

carrier and artillery mover that it was almost never used as a troop carrier.[74] The logistical capability of the division was reported to be the restraining factor on operations long before span of control or communications. This emphasized the care that would be taken to prevent Chinooks from being placed at risk by other missions.[75]

Another key link in the technological chain was the CV-2 Caribou. The Caribou was a short take off and landing aircraft purchased from the De Havilland corporation of Canada. The Caribou was such a critical link in the logistics chain that many of the scenarios in the tests of the 11th Air Assault required the construction of hasty airfields.[76] However, the Air Force perceived that the fixed wing caribou was a direct challenge to the lift capability of the Hercules C-130. Eventually the CV-2 would be transferred to the Air Force in 1966.[77]

A technology that was important to the design of the air assault division, and yet which would serve as the magnet for Air Force opposition was the armed Mohawk. The armed Mohawk was critical to the Howze boards vision of the air assault division in that it gave the division a dedicated fixed wing close air support capability.[78] The Mohawk had been one of the two exceptions to the "roles and missions" dividing line between the Army and the Air Force (the other was the Caribou).[79] The exception was granted because the

Mohawk was a joint Army - Marine Corps program. As a result the Mohawk had been designed with weapons mounting points to meet Marine Corps requirements. The Howze board was delighted to discover this during their testing and brought in Navy and Marine Corps technicians to show them how to mount weapons and bombs to the aircraft.[80] The tests by both the Howze board and the 11th Air Assault tests reported the armed Mohawks as being an integral part of the air assault tactics.[81] The 1st Cavalry Division deployed to Vietnam without the armed Mohawks because of Air Force opposition. The AH-1G Cobra gunship was later fielded to perform a similar fire support function.[82]

A final technology, often missed, that was essential to the performance of the air assault division was fire support. While aerial rocket artillery would provide fire support during the initial assault it lacked the capability to provide the sustained fires of traditional cannon batteries. The 105mm towed howitzer then in the inventory was too bulky to air move and provide fire support. The air assault division tested new, light howitzers to provide fire support, and the airlifted artillery support provided by the cannon batteries of the division proved to be quite successful.[83] Employing these cannons with a 360 degree field of fire exceeded the scope of 1962 doctrine.

Force Design, though, is not only about technological solutions, it is also about the doctrine to employ the solutions.[84] Doctrine for the employment of the air assault division was drawn from the cavalry divisions of the pre Second World War era. Much of the doctrine was taken chapter by chapter from the last horse cavalry field manual, written in 1935.[85] This was a natural linkage in many respects. Lieutenant General James M. Gavin had written his first article on air cavalry in 1954.[86] The 1960 Rogers board had inserted a recommendation for the creation of an "Air Cavalry unit" in its report.[87] Lieutenant General Howze, who headed the Howze board had been a Cavalry officer until the start of the Second World War. Both Howze and Gavin saw a need for a return of mobile cavalry to the battle field, and both were convinced that the tool to do it was the helicopter.[88] Both the Howze Board and the air assault tests conducted extensive evaluation of tactics and procedures but the underlying premises were never challenged and alternative approaches never studied. The Howze board had received extensive briefings on Soviet doctrine and armaments, but apparently never examined their air mechanized force's doctrine to see if it was more viable than the cavalry model.

The strength of the cavalry model was the unity of vision among the officers preparing the doctrine for the

employment of these units. Internal argument seems to have been very low and internal acceptance of the cavalry model seems to have been virtually unchallenged. The traditional model of using cavalry in a deep penetration or pursuit role lends itself to designing an organization that is operationally focused and competent.

IX. Conclusions and Recommendations

The force design process has improved significantly since the Howze board, but many of the same potential pitfalls remain. One of the critical components of the force design process is the creation of an overarching vision for what the new organization is intended to achieve. For the Howze board there was not a common shared vision of what would be the capabilities of the force. The first vision was laid down in the Harper's article by Lieutenant General Gavin.

A second vision was that of Lieutenant General Howze, who because of his position as president of the board and his willingness to do a significant portion of the writing of the board's final report, was able to exert a significant influence on the board's outcome. At the same time the vision of the aviation community within the army affected the outcome of the board. The aviation community already started work on arming helicopters, testing air cavalry

concepts and developing the key technological components long before the Howze board began meeting at Fort Bragg.

Today the procedures for designing new organizations include the issuance of a written vision for the organization. The current vision for the army is TRADOC PAM 525-5, *Force XXI Operations*. The commander of the Training and Doctrine Command (TRADOC) has the doctrinal role of serving as the developer of the overarching concept. This provides a vehicle for focus of efforts and organizational continuity as conditions and personalities change over time.

While the vision process does require integration of the various elements of combat power, it must also demonstrate the linkage between strategy and tactical actions. The doctrine for developing this vision states that the concept will reflect linkages to the National Military Strategy, Defense Planning Guidance, The Joint Vision, and the Army Plan. There is little evidence that operational art is applied or considered in establishing these linkages.[89]

Once the vision is published the process of experimentation and analysis must begin. This is the crux of the process, and the most difficult as demonstrated by the Howze board and the 11th Air Assault Division. The results of the experimentation process will have a significant impact on the final structure and employment of the designed unit. The models used must consider

operational and tactical effects. Historical data, empirical evidence and modeling must all be used to construct simulations and experiments that will produce valid results. Lieutenant General Howze and the members of the 11th Air Assault Division were able to substitute personal combat experience for detailed modeling and scientific testing.[90] This luxury is largely gone from the force. Today the battle labs are in place to provide a facility for experimentation and testing for new ideas and concepts. The battle labs not only serve as a method of introducing technology into the force but should also serve as a vehicle for introducing concepts and doctrines into the force. Without a rigorous vehicle for testing both alternative material solutions and alternative concepts and doctrines the battle labs would serve the same functions as General Howze's tests of "what worked and what didn't". This technique provides little basis for rationalization of procurement strategies and more importantly provides little direction for future research and development and future organizational changes.

Another crucial element that both the Howze board and the 11th Air Assault Division failed to adequately address was the issue of force mix. The Howze board final report presented recommendations for various types of airmobile units, but failed to present the rationalization behind the

recommendation. Triandafilov, a Russian operational theorist, recognized that the operational forces do not exist in a vacuum, it is essential that you also have conventional armies to keep the enemy under pressure to reap the "operational harvest."[91] Lieutenant General Howze thought that the best way to achieve this was to have NATO provide the conventional divisions and have the United States Provide five air assault divisions.[92]

To achieve a valid testing of the operational effectiveness of a unit it must be tested as part of a larger organization in the context of a campaign. The campaign must contain the key elements of operational art, and requires a human element capable of employing operational art as opposed to simply employing a mechanistic approach.[93]

The key criteria of an operationally effective unit are the ability to achieve the breakthrough or penetration, either through combat power or with some special capability to go around or over the enemy; the ability to logistically sustain the operation; and the ability to generate sufficient combat power at the operational objective to produce operational shock. The unit must also have sufficient logistics and depth to be able to conduct successive engagements since a single engagement is not sufficient to achieve the net effect.

The Howze board report shows interest in the logistics necessary to sustain a force that would be fighting distributed, successive engagements. Most of the solutions were technical or procedural, but the evaluation of these ramifications is significant. An entire appendix of the report was devoted to the logistical studies. One of the key conclusions reached was that when operating in an unconventional situation, such as guerilla warfare, the lines of supply would be less vulnerable to interdiction because the convoys would not be vulnerable to ambushes.[94] The main weakness with this argument is that it assumes that irregular forces would not have an air defense capability. In Vietnam this proved to be untrue as irregular units possessed substantial air defense capability.[95] The other logistics changes made to support air assault operations were; a decrease of the "days of supply" carried by the division from 60 to 30, and a reduction of the number of handling steps from wholesale to the user from seven to three.[96] In net, the logisticians seemed to have a solid understanding of the problems of sustaining a unit required to conduct successive engagements, at operational depths, even if they did not understand the nature of operational maneuver.

The ability to generate sufficient combat power at the operational depth was certainly the focus of the tactical

mobility board's concept even if it was not stated in those terms. The problem of creating a force capable of engaging conventional mechanized forces and winning was examined and wargamed, both in the computer simulations and the practical exercises. Several methods were adopted to compensate for the lack of armored fire power. These changes were both in tactical concepts, organizations and material changes. The primary change in tactical concepts was to utilize the air cavalry troop to find the enemies most vulnerable point, and then utilize the mobility of the helicopter to rapidly emplace rifle units that could engage the vulnerable point directly, thus avoiding enemy armor. This vulnerable point was identified as the "point of thrust" in the final report.[97] The key element to this concept is that it was focused on finding and attacking enemy forces, not on retaining terrain.[98] The focus on enemy forces instead of terrain permitted some adaptations in organization to facilitate the air assault concept.

The organizational changes from the ROAD Division were: the air cavalry squadron for reconnaissance and screening over large distances; the replacement of a battalion of tube artillery with "Aerial Rocket Artillery;" and the addition of an aviation regiment. Excepting these changes, most of the division structure looked like the then current Army ROAD Division without most of the vehicles.[99]

The logistical changes necessary to support the air assault division were probably the most substantial of all. The logistics concept required that Air Force C-130's would move supplies as far forward as practical, direct from theater stocks, the Caribou would move supplies to a hasty forward air strip, and finally the Chinook (CH-47) would deliver the supplies directly to the consumer. Maintenance was not overlooked as a logistical concern. The Howze board developed new maintenance concepts for the helicopter. The inability to implement them immediately when the 1st Cavalry Division deployed to Vietnam produced a significant impact on the manner in which the division operated.[100] Overcoming logistical challenges would be a major hurdle on the concept's road to operational effectiveness.

The air assault division has become an important capability in achieving operational level effects in the United States Army.[101] The current design of the 101st Air Assault Division has emerged overtime from its inception under the Howze Board, through the test of combat in Vietnam and Desert Storm to its current structure. While the incorporation of combat results into unit design is always necessary, it is also important to have an institutional mechanism for ensuring that organizational designs consider desired effects. The army's organizational design process needs to consider that not all organizations can or should

be designed to produce the same results. A proper force mix is essential to fighting large scale engagements, and a unit intended as an operational element should be designed and equipped differently from an element intended as a tactical formation. The development and testing process must then have a mechanism to account for these cognitive differences and ensure that they are tested and measured. Specifically, those units intended to produce operational results must be tested on their ability to achieve penetration to an operational depth, engage in industrious maneuver, have sufficient combat power at an operational depth to obtain results, and have the logistics structures and concepts necessary to sustain the unit through repeated, successive engagements at the operational depth.

X. ENDNOTES

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[1] Shimon Naveh, *In Pursuit of Military Excellence: The Evolution of Operational Theory.* (Frank Cass: Portland Oregon) p. 2-3.

[2] U.S. Department of the Army, *FM 101-5-1* (Washington, D. C. 30 September 1997), pp. 1-115.

[3] Shimon Naveh, *In Pursuit of Military Excellence: The Evolution of Operational Theory.* (Frank Cass: Portland Oregon) p. 1.

[4] James J. Schneider, *Theoretical Paper No. 3: The Theory of Operational Art* (Fort Leavenworth Kansas: U.S. Army Command and General Staff College, 1 March 1988) p. 9.

[5] Ibid. p. 11.

[6] Vladmir Kariakovich Traindafillov, *The Nature of the Operations of Modern Armies* (Portland Oregon: Frank Cass & Co. Ltd. 1994) p. 90.

[7] Naveh, p. 13.

[8] Ibid. p. 13.

[9] Frederic A. Bergerson, *The Army Gets an Air Force: Tactics of Insurgent Bureaucratic Politics* (Baltimore Maryland: The Johns Hopkins University Press 1980). Pp. 30-31.

[10] Ibid. pp. 31-32.

[11] Ibid. p. 71.

[12] Hamilton H. Howze *A Cavalryman's Story* (Washington DC: Smithsonian Institution Press 1996) pp. 151-152.

[13] Ibid. pp. 179-181.

[14] Ibid. p. 185.

[15] Ibid. pp. 185-186.

[16] Ibid. p. 192.

[17] Bergerson, p. 106.

[18] Ibid. pp. 72-75.

[19] Howze pp. 196-206.

[20] Ibid. pp. 236-236.

[21] John R. Galvin, *Air Assault: The Development of Airmobile Warfare* (New York: Hawthorn Books 1969) p. 275.

[22] Lieutenant General John J. Tolson, *Airmobility 1961-1971* (Washington DC: US Government Printing Office 1973) p. 17.

[23] Robert S. McNamara memorandum for the Secretary of the Army, April 19, 1962 from Jacob A. Stockfisch *The 1962 Howze Board and Army Combat Developments* (Santa Monica California: RAND 1994) Appendix.

[24] Ibid. Appendix.

[25] Robert S. McNamara memorandum for Mr. Stahr April 19, 1962 contained in Jacob A. Stockfisch *The 1962 Howze Board and Army Combat Developments* (Santa Monica California: RAND 1994) Appendix.

[26] Howze, p. 237.

[27] Ibid. p. 238.

[28] Ibid. p. 238.

[29] Ibid. p. 239.

[30] Jacob A. Stockfisch, *The 1962 Howze Board and Army Combat Developments* (Santa Monica CA: RAND 1994) p. 17.

[31] Howze, p. 242.

[32] Stockfisch, p. 33.

[33] Ibid. p. 26.

[34] Ibid. p. 24.

[35] Howze, p. 251.

[36] Ibid., p 249.

[37] U.S. Department of the Army. Continental Army Command, *US Army Tactical Mobility Requirements Board: Final Report* (20 August 1962) 18967.15-A Archival Collection, Combined Arms Research Library, FT Leavenworth Kansas, 74.

[38] Stockfisch, p. 26.

[39] Tolson, p. 51.

[40] Ibid. p. 52-53.

[41] Ibid. pp. 53-54.

[42] Lt. Col. Frank F. Rathbun "Tasks of the Airmobile Test Team," *Army* June 1963, 39-40.

[43] Galvin. P. 276.

[44] Ibid. p. 280.

[45] Maj. Ben Nichols, "Sky Soldier I: The Sky's No Limit," *Infantry* November - December 1963, 4.

[46] Ibid. 65.

[47] Ibid. 65-66.

[48] Tolson, 54-55.

[49] Ibid., 55.

[50] Ibid., 56-57.

[51] Tolson, 26.

[52] Ibid., 16.

[53] Edward Hymoff, *The First Air Cavalry Division Vietnam* (New York: M. W. Lads Publishing Co. 1967) 5.

[54] Tolson, 61-62.

[55] Hymoff, 6.

[56] Ibid., 8-12.

[57] Ibid., 25-26.

[58] Tolson, 82-83.

[59] Ibid., 245-252. Note that "acceptable" loss rates are always subjective, and this comment is based on the Tolson's experience in Vietnam. In a modern context the cited loss rate of .25% might not be acceptable.

[60] Literally "It must be based upon industrious manoeuvre, expressing the dynamic interaction between the various elements within the system, as well as the relationship between the general action and the strategic aim." Naveh, 13.

[61] U.S. Army Command and General Staff College "Lesson 4. Force Development" *Resource Planning and Force Management* available at INTERNET: http://www-cgsc.army.mil/dlro/COURSES/C400-99/Lessons/LSN04/LSN04AS.DOC, 4-2, 4-3.

[62] Tolson, 88.

[63] Ibid., 72-73.

[64] Ibid., 91.

[65] Howze, 192.

[66] Lt. Col. Frank F. Rathbun (ret) "Air Assault Division," *Infantry* September - October 1963, 5.

[67] Ibid., 5-6.

[68] Brig Gen. Delk M. Oden, "The Army and Air Mobility," *Military Review*, October 1962, 60-63.

[69] Bergerson, 78.

[70] Poe, 33.

[71] Nichols, 64.

[72] Tolson, 23.

[73] Perry Poe, "How's Air Mobility," *Army* June 1963, 30.

[74] Ibid., 95.

[75] Ibid., 101.

[76] See Nichols, 7 and Howze, 244.

[77] Bergerson, 117.

[78] Howze, 236-237.

[79] Bergerson, 90.

[80] Howze, 236-237.

[81] Nichols

[82] Bergerson, 118.

[83] Nichols, 64.

[84] Specifically Doctrine, Training, Leadership, Organizations, Material and Soldiers (DTLOMS) see US Army Command and General Staff College, "Lesson 4. Force Development," *Resource Planning and Force Management*, available at INTERNET: http://www-cgsc.army.mil/dlro/COURSES/C400-99/Lessons/LSN04/LSN04AS.DOC accessed on 26 March 2000.

[85] Bergerson, 74-75.

[86] Gavin, Lt. General James M., "Cavalry and I Don't Mean Horses!" *Harpers*, April 1954, pp. 54-60.

[87] Howze, 235-236.

[88] Lt. Gen. James M. Gavin, "The Mobility Differential," *Army*, June 1963, 34-35.

[89] "Lesson 4. Force Development" 4-4.

[90] U.S. Department of the Army. Continental Army Command, *US Army Tactical Mobility Requirements Board: Final Report* (20 August 1962) 18967.15-A Archival Collection, Combined Arms Research Library, FT Leavenworth Kansas, 6.

[91] Traindafillov, 117.

[92] Howze, 152.

[93] Schneider, 2-3.

[94] Tactical Mobility Requirements Board, *Final Report*, 26.

[95] Tolson, 191, 193-195.

[96] Tactical Mobility Requirements Board, *Final Report*, 29.

[97] Tactical Mobility Requirements Board, *Final Report*, 22.

[98] Rathbun, "Air Assault Division," *Infantry* September-October 1963, 7.

[99] Rathbun, "Air Assault Division," *Infantry* September-October 1963, 5-6.

[100] Tolson, 72-73.

[101] U.S. Department of the Army, *FM 100-5*, (Washington D.C. 1993), 2-22.

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