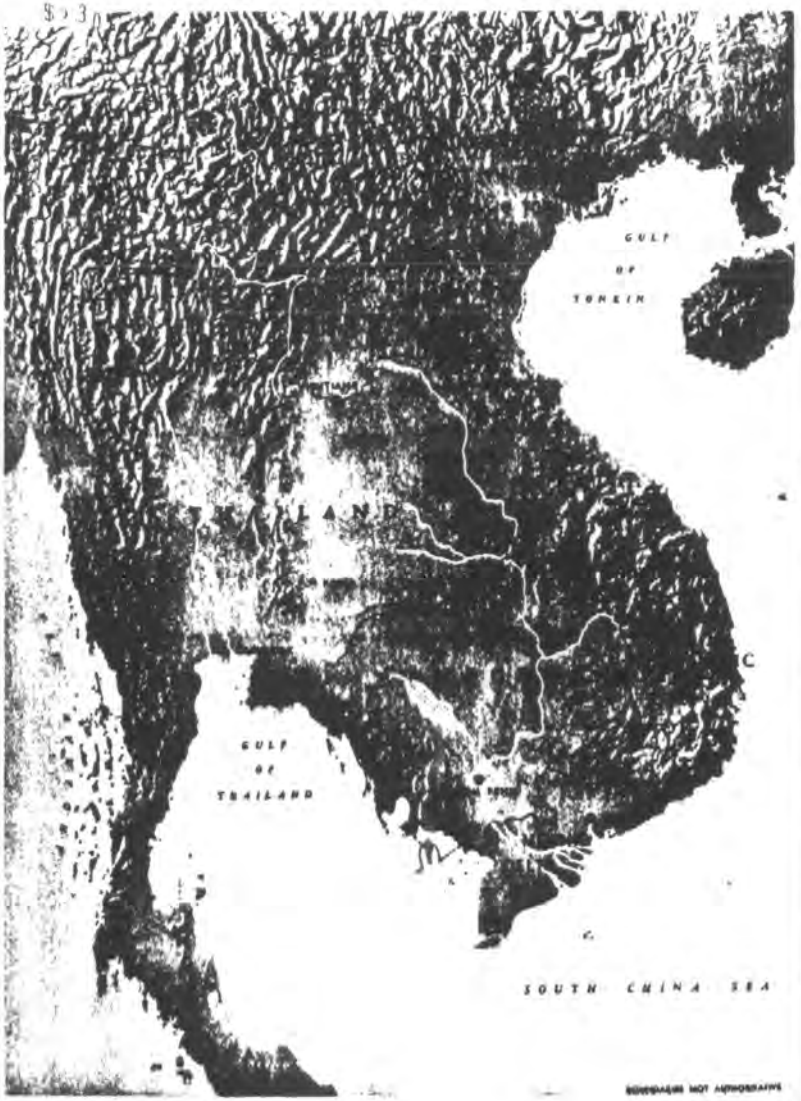
VIETNAM STUDIES

Tactical and Materiel Innovations

DEPARTMENT OF THE ARMY



VIETNAM STUDIES

TACTICAL AND MATERIEL INNOVATIONS

by
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DEPARTMENT OF THE ARMY

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Foreword

The United States Army has met an unusually complex challenge in Southeast Asia. In conjunction with the other services, the Army has fought in support of a national policy of assisting an emerging nation to develop governmental processes of its own choosing, free of outside coercion. In addition to the usual problems of waging armed conflict, the assignment in Southeast Asia has required superimposing the immensely sophisticated tasks of a modern army upon an underdeveloped environment and adapting them to demands covering a wide spectrum. These involved helping to fulfill the basic needs of an agrarian population, dealing with the frustrations of antiguerrilla operations, and conducting conventional campaigns against well-trained and determined regular units.

It is as always necessary for the U.S. Army to continue to prepare for other challenges that lie ahead. While cognizant that history never repeats itself exactly and that no army every profited from trying to meet a new challenge in terms of the old one, the Army nevertheless stands to benefit immensely from a study of its experience, its shortcomings no less than its achievements.

Aware that some years must elapse before the official histories will provide a detailed and objective analysis of the experience in Southeast Asia, we have sought a forum whereby some of the more salient aspects of that experience can be made available now. At the request of the Chief of Staff, a representative group of senior officers who served in important posts in Vietnam and who still carry a heavy burden of day-to-day responsibilities has prepared a series of monographs. These studies should be of great value in helping the Army develop future operational concepts while at the same time contributing to the historical record and providing the American public with an interim report on the performance of men and officers who have responded, as others have through our history, to exacting and trying demands.

The reader should be reminded that most of the writing was accomplished while the war in Vietnam was at its peak, and the monographs frequently refer to events of the past as if they were taking place in the present.

CHAPTER II

Ia Drang
(October-November 1965)

The battle of Ia Drang illustrates the influence of the helicopter on combat operations. It also demonstrates the usefulness of new organizations such as the air cavalry, with its greatly increased ability to locate and fight the enemy, and the airmobile division, with its great advance in mobility. The expanded role of Army aircraft is seen in such refinements as the use of the gunship and the tactical employment of airmobile troops. The battle story introduces a series of innovations developed before and during the Vietnam War.

There has been some speculation as to how the war would have been waged without the helicopter. General Westmoreland answered the question in this way:

> Suppose that we did not have helicopters and airmobile divisions today. How many troops would we have needed to accomplish what we have achieved in South Vietnam? . . . No finite answer is possible because our tactics in Vietnam were based on massive use of helicopters. . . . What would we do without helicopters? We would be fighting a different war, for a smaller area, at a greater cost, with less effectiveness. We might as well have asked: 'What would General Patton have done without his tanks?'

The helicopter was first used in combat by U.S. armed forces for medical evacuation during the Korean War. Although many helicopter assault techniques were later developed by the U.S. Army and Marine Corps, it was the findings of the Howze Board, the formation of the 11th Air Assault Division, and the development of small turbine engines that first brought airmobility into its own.

The first airmobile division was sent to Vietnam in the third quarter of 1965 as the 1st Cavalry Division (Airmobile). After establishing a base at An Khe in the II Corps Tactical Zone and conducting a few operations against local Viet Cong forces, the division showed its strength in the Ia Drang Valley in the fall of 1965.

On 19 October the enemy attacked a Civilian Irregular Defense Group (CIDG) camp at Plei Me—the opening bid in an attempt to take over the Central Highlands. By 22 October intelligence indicated that there were two North Vietnamese Army regiments in the area: the 33d Regiment, at Plei Me, and the 32d Regiment, which was waiting in ambush to destroy the expected relief column from Pleiku, north of Plei Me.

The Vietnamese II Corps commander was confronted with a difficult choice. He could refuse to go to the relief of Plei Me and lose the camp, or he could commit the reserve from Pleiku, stripping the area of defensive troops. If he lost the reserve, Pleiku would be easy prey for the Communists, who could then control the western part of the Central Highlands. He decided to ask for help from the U.S. forces. The Commanding General, Field Forces, Vietnam, Major General Stanley R. Larsen, sent the following message to Major General Harry W. O. Kinnard, Commanding General, 1st Cavalry Division: "Commencing first light 23 October First Air Cav deploys one Bn TF minimum 1 Inf Bn and 1 Arty Btry to PLEIKU, mission be prepared to assist in defense of key US/ARVN installations vic PLEIKU or reinforce II Corps operations to relieve PLEI ME CIDG CAMP."

Task Force INGRAM was airlifted from An Khe to Pleiku early on 23 October. The force consisted of the 2d Battalion, 12th Cavalry, reinforced with a battery of artillery. While the move was under way, the division commander, sensing that a decisive operation was imminent at Plei Me, obtained permission to deploy the 1st Brigade to Pleiku. The brigade headquarters with the 2d Battalion, 8th Cavalry, and two batteries of the 2d Battalion, 19th Artillery, arrived by air at Camp Holloway by midnight on 23 October to assume operational control of Task Force INGRAM. The 1st Brigade was charged with securing Pleiku, providing artillery support for the Vietnamese Army's relief of Plei Me, and furnishing a reserve force.

Meanwhile, the ARVN (Army of the Republic of Vietnam) armored relief column began moving down Provincial Road 6C toward Plei Me. At 1730 hours the North Vietnamese Army struck the relief column at two points, but 1st Cavalry artillery was called in on the ambushing enemy with deadly accuracy and was a decisive factor in repulsing the attack.

Before the relief column arrived at Plei Me, the camp had been resupplied day and night by airdrops from the Army's CV-2 (Caribou) of the 92d Aviation Company, the CV-7 (Buffalo) of the U.S. Army Aviation Test Board, and the Air Force's C-123. On the night of 24 October the weather was overcast and the camp could not be seen from the air. In order to identify a release point on which to drop the parachute loads, the camp commander fired a star-burst flare straight up through the overcast, and the pilots released their loads using the flare as a reference point. Most of the ammunition and food landed within the compound.

On the evening of 25 October the relief column arrived at the camp, which was still under siege, and immediately reinforced the defensive perimeter. By then, 1st Cavalry infantry and artillery had airassaulted from Pleiku into landing zones within close support range. The original enemy plan to destroy the ARVN relief column and then

fall on Plei Me had failed. At 2220 hours on 25 October, the 33d North Vietnamese Army Regiment at Plei Me was ordered to withdraw to the west, leaving behind a reinforced battalion to cover the withdrawal.

At this point General William C. Westmoreland visited the 1st Brigade's forward command post and directed the 1st Cavalry Division to pursue and destroy the enemy. The division's scope of operations changed from reinforcement and reaction to unlimited offense. The division was to be responsible for searching out and destroying all enemy forces that threatened the Central Highlands. The 1st Brigade pursued the battle through 9 November. The 3d Brigade took over until 20 November, when the 2d Brigade began the final operation.

The battlefield covered 1,500 square miles of generally flat to rolling terrain drained by an extensive network of rivers and small streams flowing to the west and southwest across the border into Cambodia. The dominating feature of the terrain was the Chu Pong massif in the southwestern corner of the area, straddling the Cambodian-Vietnamese frontier. For long periods this mountain mass had been an important enemy infiltration area and one of the many strongholds where enemy forces could mass and construct strong defenses under the heavily canopied jungle.

Intelligence indicated that a field front (divisional headquarters) was controlling the enemy regiments. If so, this operation marked the first time any U.S. unit in Vietnam had opposed a division-size unit of the North Vietnamese Army under a single commander.

The first significant contact was made on 1 November, when a platoon of Troop B, 1st Squadron, 9th Cavalry, overran a regimental aid station six miles southwest of Plei Me, killing fifteen enemy soldiers and capturing fifteen more. This rifle platoon had been air-assaulted into the area in response to reports that scattered groups of enemy soldiers had been sighted. Two more rifle platoons from A and B Troops were landed to sweep through the area. Just after 1400 hours, scout helicopters discovered a battalion-size enemy force moving from the northeast toward the U.S. platoons. The fighting intensified at ranges too close for aerial rocket artillery or tactical air support. The position was also beyond the range of available tube artillery. Reinforcement platoons from the 1st and 2d Battalions of the 12th Cavalry and the 2d Battalion of the 8th Cavalry landed late in the afternoon, followed by two additional platoons from the 2d Battalion, 12th Cavalry. Ground fire was intense on all reinforcement, resupply, and evacuation helicopters, and seven ships were hit by enemy fire. By 1700 hours Company B, 1st Battalion, 8th Cavalry, was committed to the battle, and by 1900 hours the platoons of the 9th Cavalry Squadron, having found and fixed the enemy, were airlifted from the area.

By the time the enemy was driven from the field the 33d North Vietnamese Army Regiment had lost its aid station, many patients, and over $40,000 worth of important medical supplies and had sustained 99 men killed and 183 wounded.

The airmobile concept had proved itself. Scout ships would reconnoiter and locate enemy groups, rifle elements would fix the enemy in place, and heliborne units, supported by massed air and ground firepower, would attack and defeat the enemy troops. These tactics worked successfully again and again during the battle.

In a well-executed ambush at 2100 hours on 3 November, the rifle platoons of the 1st Squadron, 9th Cavalry, again drew blood. Troops in one of several ambush positions located just north of the Chu Pong Mountain sighted a heavily laden North Vietnamese Army unit, estimated at company strength, moving along an east-west trail. Deciding to take a break just one hundred meters short of the ambush site, the enemy column loitered outside the killing zone for ninety minutes, while the U.S. troops waited quietly in ambush. At 2100 hours the enemy unit moved noisily along the trail. The first element was allowed to pass, and then the trap was sprung with eight claymores along a 100-meter zone. The attack was perfectly executed and the enemy's weapons platoon with machine guns, mortars, and recoilless rifles was caught in a wall of lead as the cavalrymen fired continuously for two minutes. There was no return fire.

The ambush patrol returned immediately to its base and went to work strengthening its perimeter. By 2230 hours the base was under heavy attack by an estimated two or three companies of North Vietnamese Army regulars. At midnight the perimeter was in grave danger of being overrun, but reinforcements were on the way. Company A, 1st Battalion, 8th Cavalry, standing by at the Duc Co Special Forces Camp, located twelve miles of roadless jungle to the north, had been alerted. The first platoon was on the ground and in combat forty minutes after midnight. The entire company had arrived by 0240 hours. While this type of relief and reinforcement is now routine, it was unique in November 1965. This battle marked the first time a perimeter under heavy fire was reinforced at night by heliborne troops air-assaulted into an unfamiliar landing zone. It was also the first time that aerial rocket artillery was used at night and as close as fifty meters to U.S. troops.

By dawn the enemy attack had lost momentum, and the fighting diminished to occasional sniping from surrounding trees. As a result of the battle, ninety-eight North Vietnamese soldiers were killed and ten were captured. In addition, over 100,000 rounds of 7.62-mm. ammunition, two 82-mm. mortars, and three 75-mm. recoilless rifles were destroyed, and large quantities of mortar and recoilless rifle ammunition were captured. The implications of an ambush deep within

HUEY COBRA FIRING ROCKETS AT ENEMY TARGET

what was thought to be secure territory must have stunned the North Vietnamese Army's high command.

Although the helicopter was no longer strange to the enemy, he had failed to appreciate its use in tactical roles other than as a prime mover of supplies and men. For the first time the enemy found his withdrawal routes blocked, his columns attacked, and artillery fire directed on his routes of escape—all because of the new dimension added to the war by aggressive tactical use of the helicopter. During the pursuit of the 33d North Vietnamese Army Regiment from Plei Me, the enemy was so baffled by the constant harassment and rapid compromises of "secure" way stations that the North Vietnamese Army command concluded that there were traitors in the regiment providing target information to the Americans.

Arming Army aircraft had been tried as far back as the 1950s, but the war in Vietnam brought about an intensive program to develop Army aircraft weapons. In 1962 at Nha Trang, the 23d Special Warfare Aviation Detachment (Surveillance), whose mission was to support provincial forces, tested six OV-1A Mohawks armed with .50-caliber machine guns and 2.75-inch folding-fin aerial rockets. This successful program was expanded until 1966, when Army fixed-wing aircraft were taken out of the fighter-escort mission by the Department of Defense. No approved armament program was established.

During this same period, the use of armed helicopters increased rapidly. In October 1962, the Utility Tactical Transportation Company (the Army's first armed helicopter unit) equipped with UH-1A's replaced B-26's and T-28's as escorts for CH-21 (Shawnee) troop helicopters. Losses decreased significantly. By May 1964, B-model Hueys (UH-1B) had replaced the CH-21 for carrying troops, and ten light airmobile aviation companies, with one to three armed platoons each, were in Vietnam. In 1965 the 1st Cavalry Division (Airmobile) brought the first air cavalry squadron and aerial artillery battalion to the Republic of Vietnam. Three armed Chinooks (CH-47A) were tested in 1966, but the arrival of the Cobra (AH-1G) ended that project. The Huey Cobra was introduced in 1968 with 75 percent more ordnance and 30 percent more speed than any of the Huey gunships. By April 1969, over half of the 680 helicopters in Vietnam were Cobras.

CH-47 CHINOOK

There were five types of U.S. Army units operating in South Vietnam which were authorized to use armed helicopters: assault helicopter companies (nondivision), attack helicopter companies (airmobile division and nondivision), general support companies (infantry division), aerial rocket artillery battalions (airmobile division), and air

cavalry troops (nondivision, divisional, armored cavalry regiment). Armed helicopter missions were primarily oriented to support ground maneuver forces. On such a mission, the helicopter's functions were to provide security and to deliver firepower. There were five categories of missions in which armed helicopters were commonly used: armed escort of other aircraft, surface vehicles and vessels, and personnel on the ground; security for an observation helicopter performing low-level reconnaissance; direct fire support against targets assigned by a commander of a ground maneuver element; aerial rocket artillery functions against targets assigned by a fire support coordination center, forward observer, or airborne commander; and hunter-killer tactics to provide security for an observation helicopter performing low-level reconnaissance and to deliver firepower on targets of opportunity.

One of the most significant tactical innovations to come out of early U.S. efforts in Vietnam was the "eagle flight." The exact origin of the term is obscure, but it dates from the period in late 1962 when the five U.S. CH-21 helicopter companies transporting ARVN forces were joined by the first company of armed UH-1 helicopters—the Utility Tactical Transport Helicopter Company. An elite ARVN platoon was mounted in five CH-21's and escorted by two to five armed Hueys. The gunships provided suppressive fire in the landing zone and conducted aerial reconnaissance to locate the enemy. The infantry could be landed to engage a small enemy force, check a hamlet, or pick up suspects for questioning, while the gunships provided support. If nothing was found, the troops would be picked up and the operation repeated again in another likely location. The eagle flight contributed greatly to ARVN operations. As one report stated, "The enemy can fade away before the large formations, but he never knows where the 'Eagle Flight' will land next." The success of these early operations demonstrated the feasibility of airmobile tactics in actual combat, promoted the idea of armed helicopters, and paved the way for the development of much larger air assault forces. Such practical experience was infused in the testing of the airmobile concept by the 11th Air Assault Division.

The variety of aircraft organic to air cavalry permitted maximum flexibility in organizing for combat and enabled the commander to structure the assets into teams to satisfy mission requirements. One air cavalry troop was organic to the armored cavalry squadron of the infantry division, and three were organic to the air cavalry squadron of the airmobile division. Each troop consisted of a scout platoon equipped with light observation helicopters, an aerial weapons platoon with AH-1G armed helicopters, and a rifle platoon with organic UH-1H utility helicopters. In Vietnam the commander employed various teams in combat operations. A red team consisted of two gunships, AH-1G Cobras, with a variety of armament. It was strictly an offensive weapon, readily available to the commander. A white team, consisting of two light observation helicopters armed with 7.62-mm. miniguns, was used to reconnoiter areas where the enemy's situation was unknown and significant contact was not expected. One of these helicopters flew a few feet above the ground or trees to conduct close-in reconnaissance. The other flew at a higher altitude to provide cover and radio relay and to navigate. The higher ship also functioned in a command and control capacity. A pink team was a mixture of red and white, one light observation helicopter and one Cobra. The observation helicopter followed trails, made low passes over the enemy positions, and contoured the terrain in conducting its reconnaissance mission. The gunship flew a circular pattern at a higher altitude in the general vicinity to provide suppressive fire and relay information gathered by the observation helicopter. When outside of artillery range or in areas considered to be extremely dangerous, the pink teams were used in conjunction with a command and control helicopter. If one helicopter was downed by enemy fire, the remaining aircraft provided cover until a reaction force arrived. Pink teams could also adjust artillery fire, although the AH-1G with its twin pods of 2.75-inch rockets was comparable to a 105-mm. howitzer. Pink teams were the most prevalent tactical combination of aircraft in the air cavalry troop.

A blue team was a structured number of UH-1H aircraft transporting the air cavalry troop's aerial rifle (aerorifle) platoon or part of a ground cavalry troop of the cavalry squadron. The blue team normally worked with pink teams. The aerorifle platoon of the air cavalry troop was transported in its organic aircraft in a great variety of roles. When the aerorifle platoon was employed, a rifle company from one of the battalions in the area was designated as the backup, quick reaction force. The air cavalry troops were normally assigned ground and aerial intelligence, security, and economy-of-force missions.

Intelligence missions, oriented on the enemy, included visual reconnaissance of routes, areas, and specific targets, bomb damage assessment, landing zone reconnaissance and selection, target acquisition, prisoner capture (body snatch), and ranger and airborne personnel detector operations. The value of the air cavalry as the eyes of the commander was inestimable. The body snatch was a special operation to capture prisoners or to apprehend suspected enemy personnel. In such an operation, the helicopter demonstrated its flexibility. Using an aircraft and ground force "package" structured to the particular situation, the air cavalry commander pinpointed the target individual by employing scout helicopters and then landed one or more squads of the aerorifle platoons to accomplish the snatch. Scout air-

craft screened the area while the Cobras provided cover. The snatch team package normally included a UH-1H command and control ship to direct and co-ordinate the mission. Executed as a quick reaction technique, body snatch operations provided the commander with a rapid means of gaining new intelligence.

Ranger long-range reconnaissance patrols operated in small teams within the division area. The team members were qualified for airborne operations and trained to rappel and use special recovery rigs. They were capable of sustained operations in any type terrain for a period of five to seven days. Air cavalry supported the rangers with UH-1H transport, aeroweapons support, a command and control aircraft, and an immediate reaction force of an aerorifle or airmobile platoon. Techniques to deploy the teams included false insertions, low-level flights, and, on occasion, landing both the aerorifle platoon and the ranger team simultaneously. The aerorifle platoon was subsequently withdrawn, leaving the rangers as a stay-behind patrol. During operations outside the range of tube artillery, the rangers relied heavily on aeroweapons gunships (AH-1G).

Security missions were primarily oriented toward friendly forces to provide them with early warnings and time for maneuver. Security missions included screening operations, first- and last-light reconnaissance of specified areas, and protection for convoys and downed aircraft.

Air cavalry troops often provided surveillance of an extended area around a stationary or moving force. Pink teams maintained radio contact with the ground commander and reported enemy positions, trails, or troop sightings in order that appropriate action could be taken. Pink or red teams were capable of engaging the enemy with their own organic weapons and of adjusting artillery and air strikes to reduce an enemy threat.

When conducting first-light reconnaissance around a unit field location, the pink teams began their flights before daybreak to be on station at first light. En route the team leader contacted the ground unit commander to request artillery advice and to ask whether the ground unit had any particular area of interest. Last-light reconnaissance began an hour and a half before dark in order to be completed by nightfall. When a target was discovered, the team reported to the ground unit responsible for the area and requested clearance to fire. All enemy sightings were reported to the unit in whose area the teams were operating.

The composition of a convoy security force varied with the size of the convoy, the terrain, and the enemy's situation. The scout elements, either one or two armed light observation helicopters, provided fire support, radio relay, rapid artillery adjustment, and command and control. The aeroweapons platoon could provide quick fire support if the convoy were ambushed, and the aerorifle platoon could be quickly brought in to assist. Other helicopters were then used to move the backup reaction force quickly into the ambush area.

When an aircraft was downed within the division area of operations, a pink team was immediately dispatched to locate it. Then an aerorifle or ground cavalry platoon was brought into the area. The pink team screened the area surrounding the aircraft until both the aircraft and security platoon were evacuated. Although platoon personnel were trained to rig aircraft for evacuation, the normal procedure was to bring in a technical inspector and qualified maintenance personnel to prepare the aircraft.

Economy-of-force missions for airmobile cavalry included artillery raids, combat assaults, ambushes, delaying actions, prolonged security for elements constructing fire bases, and base defense reaction force operations.

Artillery raids supported by air cavalry units included both the tube and aerial rocket artillery raids, delivered into areas where the enemy considered himself safe from such fire. During a tube artillery raid, the air cavalry troop reconnoitered the selected landing zone and secured it with an aerorifle platoon before artillery was landed by CH-47 and CH-54 aircraft. Pink teams conducted visual reconnaissance to develop targets of opportunity and were capable of adjusting fire and conducting immediate damage assessment.

The aerorifle platoon was used to exploit significant sightings or to conduct ground damage assessment. In raids by the aerial rocket artillery battalion, the air cavalry units performed similar missions except that no landing zone had to be selected and developed.

Fire base construction missions involved an aerorifle platoon, an engineer team, and a pink team. The aerorifle platoon was inserted (by rappel, if necessary) into the proposed landing zone to provide security for the engineers. After a landing zone had been cleared for one ship, additional engineer equipment was landed to enlarge the area to the required fire base dimensions. Pink teams conducted screening operations around the troop elements; co-ordination was achieved through a command and control aircraft. After a one-ship landing zone was prepared, infantry troops were usually brought in, and the aerorifle platoon could then conduct reconnaissance of likely enemy positions in the vicinity. This platoon was also capable of conducting limited combat assaults and ambushes. When teamed with scout and aeroweapons platoon elements of the air cavalry troop, it constituted a balanced combined arms team.

Although night helicopter assaults were rare in the early operations in Vietnam, the Army did work toward developing effective night techniques. Experience has shown that all missions and roles

normally fulfilled by helicopters during daylight hours can be successfully completed in darkness by aircraft equipped with navigation aids and night vision devices. Vietnam proved that helicopters could be used at night to greatly increase U.S. maneuver superiority over the enemy. Most of the night combat assaults were made to reinforce units in contact with the enemy; however, they were also made to gain tactical surprise, position blocking forces, and set up ambushes.

The first night reinforcement of U.S. troops under fire occurred during the firefight following the 1st Squadron, 9th Cavalry, ambush. The landing zone, which could accommodate only five helicopters, was under continuous fire during all landings. The only light available to the pilots was that from machine gun tracer rounds. This firefight also marked the first time aerial rocket artillery was employed at night in close support of friendly positions.

The first night combat assault involving airmobile 105-mm. howitzers occurred on 31 March 1966 as part of Operation LINCOLN by the 1st Cavalry Division (Airmobile). When elements of the 1st Squadron, 9th Cavalry, reinforced by a rifle company, became heavily engaged in the early evening hours, a second rifle company and Battery B, 2d Battalion, 19th Artillery, were brought into a previously unreconnoitered landing zone at 0105 hours. The fire support from the battery contributed significantly to the total of 197 enemy soldiers killed in the engagement.

The first U.S. battalion-size night combat assault took place on 31 October 1966 when the combat elements of the 2d Battalion, 327th Infantry (Airborne), 101st Airborne Division, were lifted into two landing zones near Tuy Hoa by the 48th and 129th Assault Helicopter Companies and the 179th Assault Support Helicopter Company of the 10th Combat Aviation Battalion. Twenty-four UH-1D, six UH-1B, and four CH-47 helicopters were used. The night before, the 10th Combat Aviation Battalion had conducted a deception operation involving a simulated night combat assault with preparatory fire by tactical air, artillery, and gunships and with illumination by flares. The actual operation was executed without preparatory fire and illumination. Pathfinders and security elements were positioned in the landing zones prior to the main assaults. Helicopters flew nap-of-the-earth flight paths to gain further surprise.

The desire to deny the enemy freedom of movement at night led helicopter units to experiment with a variety of lighting systems. The earliest systems were known as the Helicopter Illumination System (Lightning Bug-Firefly) and were characterized by a fixed bank of C-123 landing lights mounted in a gunship. The crew would find and hold the target with the lights while other gunships engaged the enemy. In the Mekong Delta an OV-1C Mohawk was often used as part of the team, locating targets by an infrared device and vectoring the

FIREFLY ILLUMINATION SYSTEM

light ship onto the target. A series of refinements were made which included developing a focusing arrangement for the illumination system, testing various searchlights, and using the night observation device as a passive means of detection.

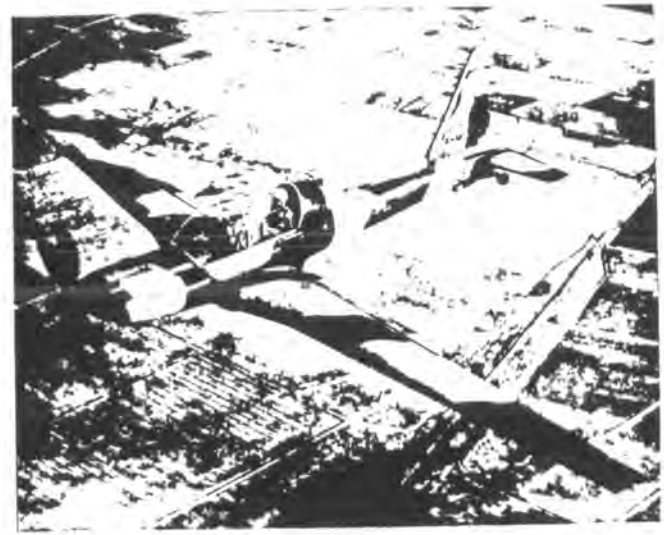
When the Cobra was introduced into the theater, the UH-1D/H Nighthawk was developed in the field. The basic components of the Nighthawk were an AN/VSS-3 Xenon searchlight (component of the Sheridan Armored Reconnaissance Airborne Assault Vehicle), a coaxially mounted AN/TVS-4 night observation device, and an XM-27 El 7.62-mm. minigun system. The searchlight provided both white light and infrared, while the minigun system mounted in the cargo compartment allowed the Nighthawk to engage the target or provide suppressive fire. Normal use involved a Nighthawk team (one UH-1D/H with the light and one or two AH-1G gunships) working either an area or specific targets already pinpointed through other methods. Ground controlled approach radar was often used to provide navigational assistance to the team. The UH-1D/H would fly at fifty knots 500 feet above the terrain with the gunships to the rear at about 1,500 feet. When the light ship detected a target with infrared light, it could either turn on the white light or open fire with the minigun, with the accompanying gunships then firing into the minigun's tracer pattern. The Nighthawk was very effective in flat, open terrain. In mountainous, canopied jungle it was limited to roads, trails, and Rome plow cuts. Nighthawk was employed to a limited extent in base camp defense, in checking out radar sightings, in sensor activity, and in mechanical ambushes.

In May 1966, five UH-1C gunships equipped with low-light-level television were deployed to Vietnam to test the use of TV as a night vision and target detection aid. Operating in the Mekong Delta, the gunships had limited success; however, the concept and the equipment needed further refinement. In November 1969, three INFANT (Iroquois Night Fighter and Night Tracker) systems arrived in Vietnam. Each system consisted of a UH-1H helicopter with an M21 armament subsystem (7.62-mm. miniguns and 2.75-inch rockets) and an image intensification system for night vision, AN/ASQ-132. This refined equipment was tested in night combat operations in the III and IV Corps Tactical Zones. INFANT increased the ability of the helicopter to perform its attack and surveillance operations at night.

Helicopters also provided considerable nighttime support to ground forces by using MK24 aircraft flares, by resupplying ammunition in an emergency, and by evacuating the wounded. Base camp defenses were strengthened by gunships, which flew mortar patrols, visually sighted and attacked enemy mortars, and transported ready reaction forces to check out radar sightings or to provide rocket and mortar support in standoff attacks. However, the effectiveness of surveillance by aircraft at night was limited, because the noise of the aircraft warned the North Vietnamese Army and Viet Cong of its approach and gave them time to hide.

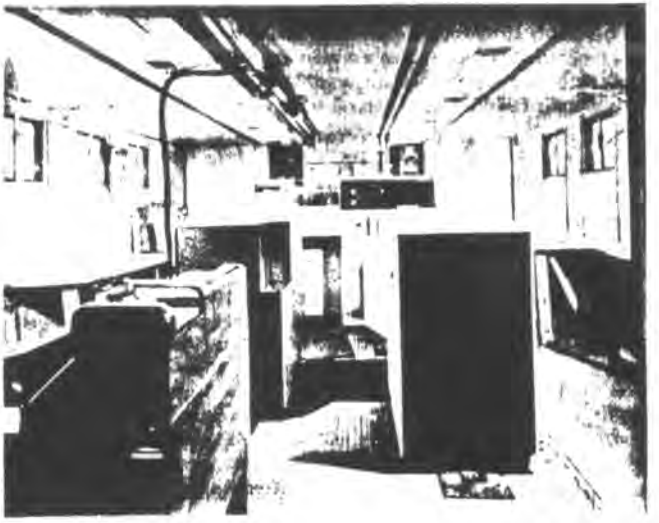
The U.S. Army developed a new surveillance aircraft for use in Vietnam. In April 1967, Lockheed Missiles and Space Company was selected to build two experimental, low-noise aircraft. In September 1967, the so-called quiet airplanes were deployed to the IV Corps Tactical Zone for sixty-day evaluation. Nothing more than a modified glider with a wooden propeller driven by a 100-horsepower engine, the aircraft could fly slowly and quietly while the pilot conducted visual reconnaissance. During the test, the quiet airplanes conducted reconnaissance missions before and after a strike; surveillance operations over areas, canals, rivers, roads, and along the coastline; and searches around the perimeter. When the test was concluded, the aircraft was judged to be valuable; however, several improvements were recommended. The Lockheed Aircraft Corporation then developed a much improved model, which was designated the YO-3A, Quiet Aircraft. The YO-3A was a more sturdy aircraft, powered by a muffled 210-horsepower engine. It had a night vision aerial periscope with an infrared illuminator and a laser target designator. The Quiet Aircraft was deployed to Vietnam in the summer of 1970.

The largest fixed-wing aircraft in the Army's inventory was the CV-2 Caribou. It was the workhorse of aerial resupply in the early phases of the war. The CV-7 Buffalo, a turbinized version of the Caribou, had a 30-percent increase in load-carrying capacity. Two Buffaloes were flown from Fort Rucker, Alabama, to Vietnam in the fall of 1965 and evaluated during combat missions. The results were quite successful; however, all the Buffaloes as well as the Caribous were transferred to the U.S. Air Force in the spring of 1967.



YO-3A Quiet Aircraft

The helicopter and airmobile techniques gave the commander new capabilities; the old time-distance factors and terrain considerations were outmoded. In the airmobile division, the helicopter was not used just as a means of transporting by air—such as troop movement, reinforcement, medical evacuation, and resupply—but was totally integrated into operations by commanders at all levels. The readily available air assets were automatically considered in maneuver plans against the enemy, in intelligence gathering, in fire support, and in logistic operations.



INTERIOR OF UNIVAC 1005 COMPUTER VAN

Another major activity at Cu Chi was the intensive Army aircraft maintenance program. All divisions in Vietnam required this massive effort, and each division base camp devoted a major portion of its area and resources to aircraft maintenance. Lieutenant General Julian J. Ewell in his debriefing report wrote:

> Aircraft maintenance is the most important single area in the division, due to the fact that the tempo of operations is dependent to a large degree on a high aircraft availability rate. With a fixed base system as in Vietnam, one can optimize the aircraft maintenance system (hangars, hardstands, lights, etc.) and achieve peacetime availability rates under combat conditions. We flew the fleet 90 hours per month per aircraft (and were edging up to 100 hours) and kept the availability rate over 80%. Hueys and Cobras could be kept up in the high 80's. This required a virtuoso maintenance performance with iron control over every aspect of both aircraft operations and maintenance.

The aircraft maintenance program in Vietnam started at the top with the 34th General Support Aviation Maintenance and Supply Group, which provided limited depot-level maintenance, general support, backup direct support maintenance, and supply support for all Army aircraft in Vietnam. Support was also given for airframe, power-plant, armament, and avionics repair. From early 1965 the 34th General Support Aviation Maintenance and Supply Group grew to four aircraft maintenance and supply battalions with a total of ten direct support and five general support companies, because the number of aircraft increased from 660 in 1965 to over 4,000 in late 1968. Backup maintenance was given to both the division maintenance units and the 1st Aviation Brigade. The brigade, in turn, provided supplemental logistic and tactical airlift throughout Vietnam.

Concepts relative to Army aviation in land warfare had never been thoroughly tested in combat; therefore, Vietnam was something of a laboratory for the discovery and development of many innovations in aviation operations. As a report by the Pacific Command on the war in Vietnam states:

> Several actions were taken to speed maintenance and repair procedures. Direct support maintenance detachments were provided to all separate helicopter companies. This additional maintenance capability was immediately reflected by a corresponding rise in aircraft availability rates.

Initially, direct support aircraft maintenance detachments were attached to nondivisional aviation units. Next, many detachments were completely consolidated with the service platoon of the parent aviation company, allowing better use of supervisory personnel. Responsiveness to the aviation unit's over-all flying mission was greatly increased. Studies made in 1966 revealed that for divisional units the number of aircraft available had risen approximately 15 percent. The studies also showed that the maintenance system of the separate aviation units was capable of more complete direct support maintenance than was the conventional divisional maintenance system. The nondivisional units provided, in effect, a one-step maintenance system by integrating organizational and direct support aircraft, avionics, and armament maintenance efforts. A study by the Army Concept Team in Vietnam recommended approval of decentralized direct support aircraft maintenance for all standard infantry divisions in Vietnam. Major General George I. Forsythe in his debriefing report wrote, "Sufficient advantages accrue from the decentralized maintenance concept to warrant implementation at the earliest practical time."

The recovery of disabled aircraft was another mission performed daily by aircraft maintenance units in Vietnam. The 56th Aircraft Direct Support Maintenance Company recovered over 350 downed aircraft in 1968 alone. The former commander of the 56th, Lieutenant Colonel Emmett F. Knight, tells how "Goodnature Six" and many other direct support units accomplished the mission of recovery.

> The aircraft recovery team is organized around the UH-1H. It is the rigging ship and carries the team, tools and equipment required to prepare a downed aircraft for airlift. The rigging ship provides weapons for fire support while on the ground and the necessary radios to control the operation.

RECOVERY OF DOWNED HELICOPTER BY CH-47 CHINOOK

A normal mission might begin with a radio or phone call to the Direct Support Company's operation officer. This request includes all necessary information: type of aircraft, location, extent of damage, security situation, etc. . . . The recovery officer (airlift commander) is notified immediately and begins his planning. . . . He makes a thorough map reconnaissance, does some rapid time-distance planning and places a call to the unit supplying the CH-47 (Chinook). He will pass the mission, including time on station which he has calculated, to the Chinook unit control station.

Meanwhile, the copilot of the rigging ship will have the recovery ship wound up. Takeoff is initiated within minutes after the mission is received. . . . The flight plan is opened and radar monitoring is requested. Artillery advice is checked periodically along the route.

As the flight progresses into the area where the downed aircraft is located, contact is made with the ground forces operating in the area. The troops at the site report on the exact situation as final approach is initiated.

On the ground the rigging crew from the UH-1H begins preparing the downed aircraft for the imminent pickup by the CH-47 which should arrive on the scene momentarily. The pilot of the Chinook receives advice and assistance from the recovery officer while on approach, as the rigging crew completes the hook-up, and during departure from the area. All elements are then notified that the extraction has been completed.

Nearly every aircraft which crashes, is shot down or forced to land in enemy controlled or contested territory will be recovered for repair or salvage. The effort will be coordinated by the aircraft maintenance direct support unit.

Between 1965 and 1971, the CH-47 (Chinook) rescued downed aircraft worth approximately $2.7 billion.

A related innovation which helped to sustain the number of division aircraft available was the development and use of a floating aircraft maintenance facility. This facility was a Navy seaplane tender converted into a floating depot for aircraft maintenance. The ship, the USNS *Corpus Christi Bay*, arrived on station in Vietnam on 1 April 1966. By July production reached 34,000 man-hours per month of manufacturing, disassembling, repairing, and rebuilding operations. During fiscal year 1969, a total of 37,887 components valued at $51.9 million was processed. Ninety-one percent were returned to serviceable condition. The 34th General Support Group reports indicate that the floating aircraft maintenance facility alone was responsible for an additional 120 aircraft available daily in Vietnam.

In the final analysis, the base camp and its many facilities were many things to many people. It was a "Holiday Inn" to the soldier in the field and a base of operations for the logisticians. It represented a drain on resources of the combat commander, but it permitted the aircraft mechanic to do his job. It was a phenomenon of the area war.