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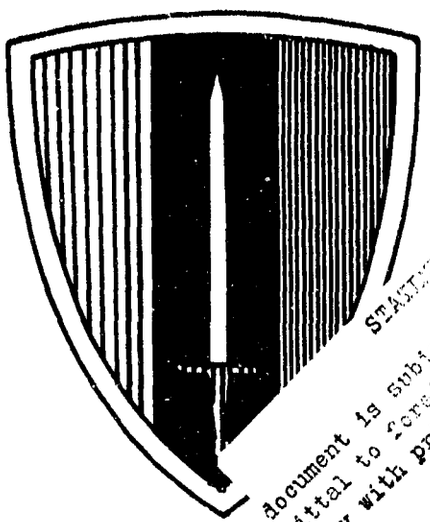

BATTLEFIELD REPORTS

A Summary of Lessons Learned

Prepared By
HEADQUARTERS, US ARMY VIETNAM

30 June 1966

Volume No 2

BATTLEFIELD REPORTS

A Summary of Lessons Learned.

Volume II

(1 October - 31 December 1965)

Prepared By

Headquarters, US Army Vietnam

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UNITED STATES ARMY, VIETNAM
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1. The attached publication, "Battlefield Reports - A Summary of Lessons Learned", reflects the experiences and lessons learned as reported by US Army units in a special, one-time report covering the period 1 October to 31 December 1965. The period involved was one during which the troop strength of US Army Vietnam increased from approximately 80,000 to 120,000; the logistical complexes grew extensively in number, capacity, and diversity; and the combat forces assumed an offensive role in destroying the Viet Cong and the infiltrated units of the North Vietnamese Army.

2. Because of those significant changes, this volume covers a wider range of subject material than was covered by Volume I. The number of items concerning unit deployments and their logistical support attests to the magnitude of the associated problems. The unique aspect of this publication is that all of the lessons, whether related to combat or support operations, are eyewitness, unedited accounts and, as such, reveal the incidents as the commanders actually experienced and described them. Thus, each reader can draw his own conclusions and determine the extent of applicability to his particular organization and its operations. The additions made by this headquarters were intentionally limited to identifying the contributing organizations.

3. I am convinced that sharing the benefits of other units' experiences in a timely manner is one of the primary ways in which we can achieve a substantial savings in men, materiel, money and time. Therefore, I encourage full use of this publication for that purpose.

4. Volume III, which will cover the period 1 January to 30 April 1966, will be published in the near future.

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JEAN E. ENGLER
Lieutenant General, US Army
Deputy Commanding General

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25 - CG, 25th Inf Div (-)
5 - CG, 3d Bde, 25th Inf Div
12 - CG, 1st Bde, 101st Abn Div
2 - CG, 2d ROK Marine Brigade
12 - CG, 173d Abn Bde (Sep)
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PREFACE

The "lessons learned" presented in this volume are extracts from official reports; they cover every facet of the stability operations in the Republic of Vietnam. There are situations and solutions of interest and educational value to any military professional.

The communist enemy in RVN does not conform to any rigid tactical doctrine and his techniques are unpredictable. Crafty and tough, he spreads a reign of terror while standing to fight at times and places of his choice. The lessons he has taught us so far underscore the statement in FM 31-16 (Counterguerrilla Operations):

> "COUNTERGUERRILLA WARFARE IS A CONTEST OF IMAGINATION, INGENUITY, AND IMPROVISATION BY THE OPPOSING COMMANDERS. COMMANDERS MUST BE EVER ALERT TO CHANGE OR ADAPT THEIR TACTICS, TECHNIQUES, AND PROCEDURES TO MEET THE SPECIFIC SITUATION AT HAND. ONCE THE ROUTINE OPERATIONS OF A COUNTERGUERRILLA FORCE BECOME STEREOTYPED, SURPRISE (A MAJOR INGREDIENT OF SUCCESS) HAS BEEN LOST."

This volume of "lessons learned" follows a previous effort published in September 1965. Volume III, which will be published in the near future, will cover the experiences from January to April 1966. The several volumes are designed to complement each other; however, no effort is made to identify repetition of the same mistakes.

Further information concerning subject matter in the USARV series, "Battlefield Reports - A Summary of Lessons Learned", may be requested from the Doctrine and History Division, ACofS, G3, United States Army Vietnam, APO San Francisco 96307.

HERBERT E. WOLF
Colonel, GS
ACofS, G3

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Section I

A SUMMARY OF LESSONS LEARNED
IN
"COMBAT OPERATIONS"

1. General Observations.

a. Standard Procedures.

"Operations conducted in Vietnam to date have demonstrated the importance of standard SOP's, SOI's and training. With standard procedures, any battalion can work under any brigade, and companies can work when attached to any battalion. This has proven particularly important in air assault operations, since every unit not engaged is, in effect, a possible reserve for every other unit."

SOURCE: Headquarters, 1st Cavalry Division (AM)
(Extracted from a special report.)

b. Leadership.

Item: "The war in Vietnam is a small unit leader's war.

Discussion: "Because of the extensive use made of patrol tactics, and the large number of semi-independent platoon and company missions performed by our units in Vietnam, the knowledge and skills of the small unit leader are more important than ever before. All squad/team leaders, and other EM in positions of responsibility such as radio-telephone operators, must be thoroughly familiar with the adjustment of the artillery and mortar fire, and must be capable of calling for and adjusting TAC Air. Leaders of small units must be highly trained in cross-country navigation, map reading, use of field expedient antennas, ambush and counter-ambush techniques, and day and night patrolling, to mention just a few. The success of an operation frequently depends entirely on how well the squads and platoons perform their assigned tasks. Leaders must be trained to a very high state, and given missions and responsibilities commensurate with his training. Unit commanders who try to retain direct centralized control of their units in the jungle and mountainous terrain of Vietnam will not succeed as well as those who give mission type orders, and who allow their leaders to take action within the scope of that assigned mission.

Observation: "Constant and continued emphasis should be placed on training and preparing the small unit leader for combat in Vietnam, with emphasis on those skills designed to allow him to operate with self-confidence and assurance, even in the absence of orders."

SOURCE: Headquarters, 1st Brigade, 101st Airborne Division

c. Contact in Jungle Terrain.

Item: "New Brigade Tactic.

Discussion: "In the dense jungle terrain of RVN most enemy contacts are made at distances of 15 to 30 meters. Once contact is made with an enemy employing automotic weapons, the contacted force is relatively glued to its position and it is difficult to use heavy supporting fires on the enemy front lines. One technique used successfully by this brigade was to precede the main body by 100 or 200 meters during an approach march with approximately five fire teams of five men each. In this manner, the minimum of forces will be committed when contact is made, enabling the maximum freedom for maneuver of the main body.

Observation: "Utilization of this tactic will enable US forces in contact to utilize heavy supporting fires before committing their force into engagement."

SOURCE: Headquarters, 173d Airborne Brigade (Separate)

d. Target Detection and Destruction.

"Operations by the division elements in the Pleiku area refined a previously tested technique of reacting to enemy targets of opportunity. All surveillance and intelligence reports were radioed directly to the forward DTOC. This raw data was evaluated immediately. The DTOC then reacted as follows:

(1) "Information on any target confirmed in the vicinity of maneuver elements was passed to the brigade. The brigade reacted by maneuvering forces to engage the target, by firing artillery, by directing supporting TAC air or by any combination of these actions.

(2) "If a target was of no immediate threat to maneuver elements, the DTOC recorded the target for strike by close air support aircraft which could no longer remain in the tactical area or engaged it with H and I fires. During the period 18 - 22 Nov 65, twenty-two targets were

so recorded; thirteen were engaged by TAC air resulting in four secondary explosions and six cases of personnel and military structures destroyed. On four occasions aircraft drew fire. This system is ideal for use in sparsely populated areas, which allow freedom in use of TAC air and artillery."

SOURCE: Headquarters, 1st Cavalry Division (AM)
(Extracted from a special report.)

e. Movement through Thick Vegetation.

"In many operational areas, the vegetation has been found so thick that an infantry company tends to become canalized into a single file. One rifle company solved this problem by employing one platoon with a "cutting detail" of six to eight personnel which moved ahead of the unit. Using machetes and hatchets, the advance platoon would clear trails while the company (minus) established a perimeter defense. Although it delayed forward progress, it greatly reduced the company's vulnerability to enemy surprise attack and penetration."

SOURCE: Headquarters, 1st Cavalry Division (AM)
(Extracted from a special report.)

f. Forward Base Camp Relocation.

Item: "Forward base camp location must be frequently relocated.

Discussion: "During tactical operations, units establish forward base camps. To prevent the VC from locating and deliberately planning an attack against the forward base camp it should be relocated frequently.

Observation: "During tactical operations away from fixed installations, units should relocate forward base camps every 24 hours. Additionally, upon occupation and prior to darkness, registrations and fire plans for mortars and artillery must be completed. If possible, check rounds close to the perimeter should be fired. Sufficient time must be permitted before darkness for preparation of defensive positions with overhead protection. Selection and preparation of alternate and supplementary positions must be stressed."

SOURCE: Headquarters, 1st Infantry Division

g. Water Obstacles.

Item: "Crossing water obstacles.

Discussion: "Due to map inaccuracies, heavy run-off in the wet season, and limitations on aerial reconnaissance imposed by heavy jungle canopy units often find themselves confronted unexpectedly with serious water obstacles where none were anticipated.

Observation: "Units should plan for this contingency, and should carry at least one 120 foot climbing rope and five snap links per platoon. One air mattress per squad is desirable to ferry radios, machine guns, and 81mm mortar ammunition."

SOURCE: Headquarters, 1st Infantry Division

h. River Crossing.

"Rivers and streams with varying degrees of fordability have frequently become obstacles to units on patrols and large scale operations. Units should carry at least 200 feet of rope per rifle company and enough ponchos to construct rafts for the transportation of radios, weapons, and non-swimmers across unfordable streams. Nylon rappelling rope was found to be particularly suitable."

SOURCE: Headquarters, 1st Cavalry Division (AM)
(Extracted from a special report.)

i. Countersniper Action.

"One unit during the recent operation achieved considerable success in combating snipers in trees by systematically spraying all trees to their front with automatic fire, at first light, and on a given signal. The process must be deliberate in that a unit such as a squad or platoon should be given a sector to cover instead of firing at random. In addition to killing the enemy it will cause him to think twice before climbing a tree which affords him no cover but only concealment."

SOURCE: Headquarters, 1st Cavalry Division (AM)
(Extracted from a special report.)

j. Use of the "Buddy" System.

"Many friendly casualties have been caused by punji stakes, snipers firing from trees and by lead elements tripping booby traps. The use of two-man teams operating on the "buddy" system greatly reduced the occurrence of these incidents. One man should watch primarily for punji stakes and booby traps, while his "buddy" searches the trees and the

area to the front for snipers."

SOURCE: Headquarters, 1st Cavalry Division (AM)

k. Tree Climbing Techniques.

"In the Plei Me and Chu Pong areas many units placed infantry and artillery observers in trees to improve observation. Although tree climbers would have worked well, an expedient of two short lengths of rope was used. One section of rope was passed around the far side of the tree and held by hand. The second length of rope was tied to each boot leaving 12-20 inches of rope between the boots. By using the knees a tree could be climbed easily."

SOURCE: Headquarters, 1st Cavalry Division (AM)
(Extracted from a special report.)

l. Destroying Rice Caches.

Item: "In many cases, the tactical situation and/or the terrain will simply not permit the evacuation of rice caches.

Discussion: "As an alternate to extraction of large rice caches, destruction may sometimes by indicated or required. This is a difficult problem and one which has not yet been completely resolved. Attempts to burn rice with gasoline, white phosphorous and other incendiaries have been only partially successful. Rice spoilage kits (not yet available) appear to be suitable only for relatively small quantities. The method which seems most effective is to dump rice into a stream, into a rice paddy filled with water, or in rainy weather simply to scatter it on the ground.

Observation: "The best method of destroying rice is to subject it to the deteriorating effects of water."

SOURCE: Headquarters, 1st Brigade, 101st Airborne Division

2. The Enemy.

a. Battle Technique.

Item: "The enemy "close embrace," "bear hug," or "hugging" tactic.

Discussion: (1) "A marked difference between PAVN and VC fighting techniques was observed by the 1st Cavalry Division (AM) during recent operations in the Chu Pong and Ia Drang areas. The PAVN units are

better equipped and trained and fought tenaciously in the face of overwhelming US firepower. In contrast with local VC units the PAVN pressed the attack, becoming decisively engaged and disengaged only after taking severe losses. PAVN units attempted to employ "close embrace" tactics to prevent our use of supporting fires. An attacking unit must be careful to keep PAVN units at arms length because once a unit is involved in "close embrace" attempts to draw back to place supporting fires on the enemy are frequently met by the enemy's following immediately as the friendly forces draw back.

(2) "The 1st Infantry Division in II CTZ also found that the VC employed a "bear hug" tactic, whereby VC elements would maintain close contact with 1st Infantry Division troops attempting to pull back to allow air and friendly artillery to be placed on enemy positions. In this regard the 1st Division made extensive use of hand grenades and intensive small arms fire to defeat the "bear hug" tactic."

(3) "The 173d Airborne Brigade (Separate) observed the VC employing the same tactic during Operation SMASH in December 1965. "After contact was made with a VC battalion in well prepared positions, US forces were pulled back to allow friendly air and artillery fires to be placed on the forward VC positions. VC forces, utilizing a "hugging tactic," left their positions and followed the US Forces to reduce effectiveness of friendly supporting fires."

Observation: Friendly elements must be prepared for this tactic and trained to employ countermeasures.

SOURCES: Headquarters, 1st Cavalry Division (AM)
Headquarters, 1st Infantry Division
Headquarters, 173d Airborne Brigade (Separate)

b. Location of Enemy Forces.

"Observation during the Plei Me Campaign indicates that local V.C. tend to operate primarily near villages and roads. "Hard core" V.C. and PAVN units in particular, normally set up harboring sites in more remote areas close to fresh water."

SOURCE: Headquarters, 1st Cavalry Division (AM)
(Extracted from a special report.)

c. Enemy Deceptive Measures.

"During recent operations in the Ia Drang Valley, PAVN troops frequently attempted to confuse U.S. troops during battle at night by yelling 'FRIENDLY FORCES, FRIENDLY FORCES', This sometimes caused momentary confusion among our troops and allowed the enemy to either fire first or take evasive action."

SOURCE: Headquarters, 1st Cavalry Division (AM)
(Extracted from a special report.)

d. Blocking V. C. Escape Routes.

Item: "When faced with a superior force the Viet Cong normally attempt to break contact and withdraw.

Discussion: "Prompt and vigorous maneuvers by ground comanders to block escape routes, together with "Hawk Flights" of platoon size, are very effective in blocking and preventing the escape of encircled V.C. forces.

Observation: "All operation plans should provide for measures to prevent the escape of V.C. forces once contact is gained."

SOURCE: Headquarters, 1st Brigade, 101st Airborne Division

e. PAVN Mortar Firing Pattern in Support of an Attack.

"Contrary to US practice of firing mortars throughout the area, PAVN mortar firing generally is conducted only in front of their route of attack and frequently in a creeping pattern. The creeping of PAVN mortar fire will usually pinpoint the route of attack to be used in the assault of a defensive position. PAVN mortar burst patterns should be monitored to anticipate where the assault is most likely to occur."

SOURCE: Headquarters, 1st Cavalry Division (AM)
(Extracted from a special report.)

f. Concealment of Installations and Caches.

Item: V.C. use of terrain to conceal installations and caches.

Discussion: "Many V.C. campsites and training centers are located near streams and rivers. Large food and supply caches, however, are usually located in thickly vegetated areas with overhead concealment and well away from trails or stream networks.

Observation: "Units conducting S&D operations should be made aware of these V.C. techniques and should orient operations to insure that maximum emphasis is placed on searching these areas."

SOURCE: Headquarters, 1st Brigade, 101st Airborne Division

g. Use of Women and Children.

Item: "Women and children are often utilized by the V.C. in military operations.

Discussion: "Women and children are often utilized by the V.C. as trail watchers, outpost guards, decoys, ammunition bearers, porters, and handlers for the dead and wounded.

Observation: "Careful screening of all persons apprehended in an operational area, including women and children , is essential if the V.C. are to be deprived of their auxilliary support."

SOURCE: Headquarters, 1st Brigade, 101st Airborne Division

3. Intelligence.

a. Intelligence Collection.

Item: "Complete information on the V.C. is difficult to obtain.

Discussion: "To pinpoint the V.C. in a given location at a given time is difficult. The V.C. moves continuously and has the added advantage of blending in with the populace. There are positive steps that can be taken to aid in the intelligence collection effort against the enemy.

(1) "Units make complete and detailed reports.

(2) "Employ Long Range Reconnaissance Patrols.

(3) "Make maximum utilization of Vietnamese interpreters and National Police.

(4) "Make immediate exploitation of captured documents for possible information of tactical value; then evacuate to higher headquarters for further exploitation.

Observation: "Greater emphasis at squad and platoon level in the intelligence collection effort is required."

SOURCE: Headquarters, 1st Infantry Division

b. Sustained Operations Result in Better Intelligence.

Item: "Sustained operations result in better intelligence.

Discussion: (1) "Sophisticated means and devices have collected only a small portion of the basic intelligence information required.

(2) "Local agencies (RVN) seldom have available all the information desired.

(3) "The best sources of information have proven to be captives, documents and local people.

(4) "The acquisition, access to, and exploitation of these "best sources" require time and persistence. This cannot be accomplished within specified and relatively short time frames.

Observation: "Ground operations of longer duration result in better intelligence, which in turn leads to a more effective operation."

SOURCE: Headquarters, I Field Force Vietnam

c. RVN Collection Agencies.

Item: "Special Forces units, Popular Forces, District Chiefs, Village Chiefs and Police Chiefs often possess intelligence information of local VC activities.

Discussion: "Special Forces units, Popular Forces, District Chiefs, Village Chiefs, and Police Chiefs have their own intelligence networks or sources of information of VC activities in their areas. The timely utilization of the information obtained from these sources has proven to be a valuable asset in conducting operations.

Observation: "Close liaison should be maintained with ARVN, GVN, and FWMAF to insure a timely receipt of information available from them."

SOURCE: Headquarters, 1st Brigade, 101st Airborne Division

d. Documents and Captives.

Item: "Documents and captives.

Discussion: "Recent experience in Vietnam reaffirms World War II and Korean conclusions that captured documents and enemy personnel provide the most profitable source of intelligence information.

Observation: (1) "The importance of documents and captives, and the need for expeditious and proper handling and processing of documents and captives need continued emphasis during the training of individual soldiers.

(2) "In view of the dual chains of command existing in the Republic of Vietnam (RVN and US/FWMAF), intelligence personnel at all echelons must be thoroughly familiar with established and accepted procedures for processing captives and documents to assure efficient and timely exploitation of these sources."

SOURCE: Headquarters, I Field Force Vietnam

e. Quality of Vietnamese Interpreters.

Item: "Vietnamese interpreters.

Discussion: "The majority of Vietnamese interpreters thus far used by this brigade were not fully qualified or were not dependable.

Observation: "Better qualified personnel must be provided in order to quickly and efficiently exploit the advantage offered by VC suspects,

prisoners, and documents."

SOURCE: Headquarters, 173d Airborne Brigade (Separate)

f. Maps in Vietnam.

Item: "Maps of Vietnam do not accurately reflect the ground cover of the trafficability of the terrain.

Discussion: "In many instances landmarks and villages are misplaced and reliable data is not available concerning the difficulty that will be experienced in traveling the terrain.

Observation: "Engineer data and map corrections should be recorded during each operation, submitted by units, and maintained for use by the S2 for future operations."

SOURCE: Headquarters, 1st Brigade, 101st Airborne Division

g. Aerial Surveillance/Reconnaissance Support.

Item: "Aerial surveillance/reconnaissance support.

Discussion: "Each tactical headquarters requires immediately responsive aerial surveillance/reconnaissance support. The division has an organic ASTA platoon which can be responsive to the division G2. Separate brigades and field force headquarters do not currently have this direct and immediately responsive support. General support (Air Force and Army Aviation under control of higher headquarters) is not sufficiently responsive to immediate requirements because of insufficient resources and inadequate communication links.

Observation: "All tactical commands from separate brigade up should be allocated immediately responsive aerial surveillance/reconnaissance either in direct support or as an attached unit."

SOURCE: Headquarters, I Field Force Vietnam

h. Sources of Information.

Item: "Captured enemy weapons.

Discussion: "During November the brigade conducted a search and destroy operation in the Viet Cong dominated War Zone "D" in the Tan Uyen District of Bien Hoa Province. A weapon that was captured a great distance from the main battle area was turned into the Brigade S-2 a couple of days after the operation. It was determined that the unit encountered was another main force unit.

Observation: "Emphasis must be placed on turning in captured equipment immediately for identification. Even trained and disciplined troops will not do this with sufficient rapidity unless all concerned constantly stress the importance of this procedure."

SOURCE: Headquarters, 173d Airborne Brigade (Separate)

i. Side-Looking Airborne Radar (SLAR).

Item: "Side-Looking Airborne Radar (SLAR).

Discussion: "The SLAR sensor is largely ineffective in II CTZ since VC vehicular traffic is virtually nonexistant. Furthermore, limited roadways, mountainous terrain, unnavigable waterways, and jungle foliage further limit the effectiveness of radar surveillance. SLAR might be effective along coastal areas for detecting illicit waterborne traffic if the following steps were taken:

(1) "Establishment of additional restricted and prohibited areas.

(2) "Imposition of strict curfews and other controls on all coastal shipping.

Observation: "SLAR may be more effective in the delta region of southern RVN where there are numerous navigable waterways known to be used by the VC and there are fewer terrain obstructions to radar emissions."

SOURCE: Headquarters, I Field Force Vietnam

j. Cameras.

Item: "Cameras at company level.

Discussion: "Cameras are being obtained to provide each company size unit a camera for intelligence purposes.

Observation: "Recording of what we see for later study is important."

SOURCE: Headquarters, 173d Airborne Brigade (Separate)

k. Intelligence Nets.

Item: "The two-way Intelligence/Admin/Log Net.

Discussion: "During Operation Hump in War Zone "D", the brigade established a two-way Intelligence/Admin/Log net. The net functioned well; it was adequate for intelligence purposes.

Observation: "It was evident however that command emphasis was needed to keep information flowing to the rear."

SOURCE: Headquarters, 173d Airborne Brigade (Separate)

4. Planning.

a. Duration of Operations.

Item: Duration of operations.

Discussion: "Short duration operations (3 - 5 days) generally met with limited success. It was learned that Viet Cong units would avoid contact and flee into safe havens, to return upon completion of the operation by US/FWMAF and ARVN units.

Observation: "By extending the duration of search and destroy and securing operations to 2-3 weeks, the Viet Cong, who initially had evaded the friendly forces found it necessary to return to their area of previous domination for resupply and morale purposes. Their return in many instances resulted either in a substantial willingness to fight or in ralliers."

SOURCE: Headquarters, I Field Force Vietnam

b. Assigning Areas of Operation.

Item: "Areas of operation.

Discussion: "During the conduct of operations, it was learned that the Viet Cong quickly became aware of the outer extremities of the Area of Operation (AO) assigned a US/FWMAF unit; thereafter, the VC would withdraw outside the AO until the operation had terminated.

Observation: "To offset this weakness, the requested AO's are now considerably greater than the intended area of operation."

SOURCE: Headquarters, I Field Force Vietnam

c. Compromise.

Item: "Compromise of tactical plans.

Discussion: "Compromise of tactical plans is a constant problem. One possible source of compromise stems from the requirement to submit in advance a request to ARVN for operations in an area outside the assigned tactical area of responsibility. This request is then processed by ARVN through Province and District Chiefs prior to approval.

Observation: "To overcome the possibility of compromise, requests are made for much larger areas than are required for an operation. Deception plans effectively supplement actual plans by camouflaging the primary intention."

SOURCE: Headquarters, 1st Infantry Division

d. Naming Operations.

Item: "Naming operations and objective areas.

Discussion: "The English language has several words that have no equivalent meaning in Vietnamese or Korean. By naming operations and objective areas arbitrarily, without verifying that the name can be translated into the language of all participating forces, the ARVN/FWMAF are frequently confronted with a meaningless term.

Observation: "Prior to assigning names to operations, objectives, etc., names to be used must be coordinated with participating allied forces to insure that such names are translatable and meaningful to the allied forces concerned."

SOURCE: Headquarters, I Field Force Vietnam

e. Necessity for Artillery Support.

Item: "Artillery support is necessary during all phases of an operation.

Discussion: "Experience dictates that operations stand a better chance of success if artillery is available during all phases of an operation. Artillery is the most responsive type of support in the engagement of targets of opportunity and provides an invaluable base of fire for a unit that must manuever against a significant enemy force.

Observation: "Prior planning for any operation should include the positioning of artillery so as to provide immediate response to any enemy target encountered regardless of the type of operation; i.e., convoy movement, movement to blocking position, conduct of a sweep or attack, S&D operation, or withdrawal from an operational area."

SOURCE: Headquarters, 1st Brigade, 101st Airborne Division

f. Fire Support Planning.

Item: "Fire support for road movement.

Discussion: "Knowledge of the terrain and the advantage of selecting the engagement site and time, give the VC a definite advantage in the execution of successful ambushes against motorized elements. This can best be offset by good fire support planning.

Observation: "All movements over roads must be adequately protected by supporting ground/air fire. This should include planned artillery concentrations, an aerial observer, and a rapid reaction force. Convoys must operate within range of supporting artillery."

SOURCE: Headquarters, 1st Infantry Division

g. Landing Zone Preparation.

Item: "Preparations of landing zones (LZ's).

Discussion: "Patterns have been established in the preparation of the LZ for airmobile operations. Captured VC stated that as soon as the FAC aircraft is spotted, they go underground because in a few minutes the close air support aircraft will arrive. If the air strike precedes the air landing, he will then come out of his hole and proceed to attack the LZ.

Observation: "The sequence of artillery, air, and gunship preparations of the LZ should be varied."

SOURCE: Headquarters, 1st Infantry Division

5. Command and Control.

a. Command and Control Aircraft.

Item: "There is an increased demand for command and control aircraft.

Discussion: "The conduct of counterinsurgency operations in jungle or heavy forest presents a problem of command and control of units. This problem can be alleviated through the use of command and control helicopters over units conducting operations. Communications equipment in the current LOH aircraft, OH-13, is insufficient for control of more than one battalion at a time. More command and control aircraft are necessary over the battle area to coordinate troop movements and supporting arms.

Observation: "A greater density of command and control aircraft is needed for use by brigade aviation sections."

SOURCE: Headquarters, 1st Infantry Division

b. Division Forward Tactical Operation Center.

"Coordination with allied headquarters and maintaining communications with division headquarters creates many problems for brigade commanders conducting operations at extended distances from the division base.

The 1st Air Cavalry Division has solved this problem by using a CH-54 pod equipped for operating as an air mobile forward Division Tactical Operations Center co-located with the allied tactical headquarters. Communications from the forward brigade terminated at the forward DTOC and necessary information was relayed to the Division Headquarters. During operations in the Soui Ca Valley, Plei Me, Chu Pong and Ia Drang Valley, this proved to be an invaluable asset to the forward brigade commanders. All coordination with allied headquarters was accomplished at the forward DTOC allowing the brigade commanders to devote full time to tactical operations."

SOURCE: Headquarters, 1st Cavalry Division (AM)
(Extracted from a special report.)

c. Liaison.

Item: "Liaison in combined operations.

Discussion: "Combined operations with CIDG and ARVN units have been very successful. It is advisable, however, to send a liaison officer with a radio with these units during an operation in order to maintain close communication and to verify reports.

Observation: "Some form of communication and liaison must be provided when operating with ARVN units."

SOURCE: Headquarters, 1st Brigade, 101st Airborne Division

6. Combat Operations.

a. Airmobile Operations/Reconnaissance.

Item: "Reconnaissance by fire.

Discussion/Observation: "Reconnaissance by fire in open areas has proven to be a valuable air cavalry technique. Scout helicopters in one operation initiated recon by fire in 105 instances, receiving return fire from the ground in 37 instances. These areas were then fixed and proved valuable enemy targets for early artillery and TAC air fire prior to maneuver elements operating in these areas."

SOURCE: Headquarters, 1st Cavalry Division (AM)

b. Airmobile Operations/Deceptive Reconnaissance.

Item: "Deceptive air reconnaissance.

Discussion/Observation: "Although it is recognized that aircraft become vulnerable to small arms when flying at lower altitudes, a good reconnaissance cannot always be made by remaining at high altitudes. Deception as to actual area of recon is important. One method which has been used with apparent success is to fly past area of interest on a high recon for as much as 10 kilometers and returning past the area from a different direction at a low altitude, preferably at a different time of the day."

SOURCE: Headquarters, 1st Cavalry Division (AM)

c. Airmobile Operations/Air Assault Concepts.

Item: "Complexity of air assault concepts in Vietnam.

Discussion: "Air assaults in Vietnam are complex and will vary sharply, according to the terrain, enemy, and weather. Training under the CONUS air assault concept utilized "nap of the earth" flying and fast approaches. Helicopters flying under this method in Vietnam are susceptible to sniper fire.

Observation: "In Vietnam, the general practice is to conduct flights between loading and landing zones at a sufficient altitude to avoid ground sniper fire. However, if the leg is short, this is not feasible. A standard 60 knot approach into the landing zone is more effective. This angle of descent and air speed gives the pilot ample time for picking his landing spot and does not require a rapid deceleration maneuver which often results in damaged tail rotors and skid assemblies."

SOURCE: Headquarters, 1st Infantry Division

d. Airmobile Operations/Deceptive Operations.

Item: "Deceptive helicopter operations.

Discussion: "The use of multiple dummy landing zones to the flanks and rear of enemy positions, with helicopters approaching or even

touching down on several but discharging troops only on one landing zone is frequently effective in deceiving the VC as to the intent and actual location of our assaulting forces. The VC will sometimes abandon prepared positions when faced with this tactic, and then become vulnerable to preplanned artillery and air strikes directed at them, and on their escape routes. The use of this same tactic is also useful in the infiltration of long range patrols, and helps insure clandestine entry into the patrol area.

Observation: "Deceptive tactics with helicopters enhances the security of airmobile operations, increases chances of success, and helps gain surprise."

SOURCE: Headquarters, 1st Brigade, 101st Airborne Division

e. Airmobile Operations/Flight Altitude.

"Despite the fact that many of the aircraft that are hit received their hits at low altitudes, experience indicates that there are times when the best chance to successfully complete a mission is where assault altitude (50 feet or lower) is used. The situations which favor using assault altitude are:

(1) "Weather limits altitude to less than 2000 feet absolute height.

(2) "Minimum restriction to friendly support fire is desired.

(3) "Vector control aircraft are available."

SOURCE: Headquarters, 1st Cavalry Division (AM)
(Extracted from a special report.)

f. Airmobile Operations/LZ Selection.

"Experience indicates that troop landing for search and destroy operations should begin, when feasible, on high ground and extend toward blocking forces located at the base of hills. The down movement conserves the strength of personnel and at the same time allows for complete coverage of the terrain. Moreover, this procedure attacks prepared enemy defensive positions in their rear when they are primarily sited to defend against attacks coming up the hill."

SOURCE: Headquarters, 1st Cavalry Division (AM)
(Extracted from a special report.)

g. Airmobile Operations/Pathfinder Support in LZ's.

"Experience indicates that pathfinders should always be included in the initial lifts into LZ's to assume functions of navigation assistance and LZ control. The pathfinders are particularly useful in directing the aircraft into and out of the LZ between enemy and friendly fire, both day and night. The pathfinders are equipped with beacons to assist in night resupply and are also used as a reference for USAF flare ships at night operating in support of tactical operations."

SOURCE: Headquarters, 1st Cavalry Division (AM)
(Extracted from a special report.)

h. Airmobile Operations/Landing Zones.

Item: "Coordination and operation of landing zones.

Discussion: "The air cavalry squadron was frequently tasked to provide initial LZ security. Experience has indicated that the time from arrival of the air cavalry elements to the initial troop lift must be reduced to the absolute minimum, (generally to less than 20 minutes), to take advantage of a secure area before the enemy has a chance to reinforce and build up defenses in that area. In several situations where this close coordination was not accomplished the enemy closed in on the LZ and attacked the second or third lifts.

Observation: "The time between the arrival of the air cavalry security elements and the initial elements of the troop lift should be held to an absolute minimum by careful planning. Pathfinder teams should be planned for the initial lift to assure early, sufficient, orderly control of the LZ and to direct aircraft in between enemy and friendly fires."

SOURCE: Headquarters, 1st Cavalry Division (AM)

i. Airmobile Operations/Alternate Landing Zones.

Item: "Alternate landing zones.

Discussion: "An alternate landing zone should be selected for all heliborne assault operations. If conditions on the primary landing zone prove unsuitable during the initial assault, the remainder of the assaulting unit should be quickly diverted to the alternate landing zone. The alternate landing zone should be at least 1000 meters from the primary, so that it cannot be defended by the same enemy unit encountered on the primary landing zone.

Observation: "Plans for heliborne assaults must provide for the selection of an alternate landing zone."

SOURCE: Headquarters, 1st Brigade, 101st Airborne Division

j. Airmobile Operations/Helilift.

Item: "Lift capacity of the airmobile company.

Discussion: "The total lift capacity of the airmobile company experienced during operations in Vietnam is lower than that found in CONUS training situations. This results from the troop space occupied by door gunners and the increased weight of armament and armor plating. In addition, nine aircraft are diverted for gunships.

Observation: "Consideration must be given during the planning stages of airmobile assaults to insure adequate helicopters are requested for the size of the force desired in the lift."

SOURCE: Headquarters, 1st Infantry Division

k. Airmobile Operations/Management of Aircraft Lift Missions.

"When aircraft from many units must be pooled to execute a mass lift as well as several smaller missions it is best to execute a mass lift initially and then allow specific units to revert to separate missions. Except when cogent reasons dictate contrary actions, it is especially important that air assault be accomplished by a minimum number of multiple lifts, scheduled into the LZ at the maximum rate that the LZ or PZ will accommodate. These procedures

greatly reduce the exposure time of aircraft and assure having maximum combat power into the LZ in the minimum time, while providing the enemy the least chance to react to the landing."

SOURCE: Headquarters, 1st Cavalry Division (AM)
(Extracted from a special report.)

l. Airmobile Operations/Use of Nonorganic Aircraft.

"Except when cogent reasons dictate contrary actions, all possible 'hauls' should be delivered direct from the supplying agency to the rear of brigade bases in nonorganic aircraft. By using this method of resupply, we are assured of having a maximum number of organic aircraft to increase the mass, flexibility and tempo of tactical operations. This procedure was an invaluable asset to the division during operations in the Chu Pong and Ia Drang areas."

SOURCE: Headquarters, 1st Cavalry Division (AM)
(Extracted from a special report.)

m. Airmobile Operations/Resupply.

Item: "Aerial resupply.

Discussion: "Since arrival in country, aerial resupply of units has become the routine rather than the exception. Both routine and emergency aerial resupply procedures have been developed and used in our operations. For routine resupply, helicopters are dispatched to the requesting units, and lift to that unit's forward elements, where the request originated. For emergency air resupply, units submit their requirements to the brigade S-4, who then places the requirements on the Brigade Logistical Operation Center (BLOC), and assigns priorities to the resupply missions. The emergency resupply items are assembled at the battalion's helipad, and rigged for paradrop, free fall, or air land, depending on the situation in the objective area. The resupply helicopter(s) move directly to the BLOC helipad where they are loaded and dispatched. External loads, using slings and nets, have had the most practical application in aerial resupply operations. To reduce response time, a plan has been developed to establish a standard battalion emergency resupply load which sustains a battalion for one day. The prepacked packages are cross-loaded with medical supplies, batteries, small arms ammunition, water and rations. The prepacks vary in size and composition

to accommodate resupply to any size and type unit within the brigade, and the loads are coded to provide a secure and rapid means of requesting the resupply materials.

Observation: "Aerial resupply of units in combat operations has met with considerable success, and will continue to be the primary means of resupply to committed units."

SOURCE: Headquarters, 1st Brigade, 101st Airborne Division

n. Airmobile Operations/Internal Loading of Vehicles in Aircraft.

"Time is of essence when the helicopters are loading or unloading under enemy fire in the LZ or PZ. Vehicles which are loaded in a secure area going into a "hot" area should be backed into the aircraft for a speedy exit. Vehicles picked up at a "hot" PZ should be driven on forwards for speeding loading."

SOURCE: Headquarters, 1st Cavalry Division (AM)
(Extracted from a special report.)

o. Airmobile Operations/Aircraft Preventive Maintenance.

"Aircraft preventive maintenance can always be performed more effectively and adequately in the aviation unit maintenance areas. Aviation units that laager in field sites at night drastically reduce the capability of the crew chiefs to effectively perform preventive maintenance. When tactical situation requires aircraft to laager with tactical unit, sufficient daylight hours need be allotted to accomplish required preventive maintenance."

SOURCE: Headquarters, 1st Cavalry Division (AM)
(Extracted from a special report.)

p. Ambush/Stay Behind Forces.

"On several occasions, when a US unit departed an area, VC elements returned to reoccupy the area or search for discarded American equipment. During recent operations, well camouflaged US stay behind units have been successful in ambushing returning VC force.

When a stay behind force cannot be left, aerial surveillance, and H and I fires have been effective in causing VC casualties when they reenter the area."

SOURCE: Headquarters, 1st Cavalry Division (AM)
(Extracted from a special report.)

q. Counterambush/Flank Security in Ground Operations.

Item: "Flank security is vitally important to ground movement.

Discussion: "The VC is a master of the ambush techniques. Trails and roads, particularly road junctions, are prime ambush sites. Ambushes can be rendered ineffective by using the following tactics:

(1) "Conduct movements 500 meters on either side of trails to uncover ambushes.

(2) "Stress flank security and the importance of air cover/observation to personnel at all levels.

(3) "Include flank security in all training situations.

Observation: "All personnel must be made aware of the importance of flank security in the prevention of ambushes."

SOURCE: Headquarters, 1st Infantry Division

r. Combat in Urban Areas/Village Search.

Item: "The use of National Police and local officials enhances the chance of success when searching a village.

Discussion: "When a unit conducts a search of a village the presence of National Police or local officials results in greater cooperation by the villagers with the search parties. National Police and local officials are often able to point out suspects, question the villagers and act generally as a 'go-between' for the searching unit.

Observation: "The use of National Police or local officials should

be considered when planning a search operation."

SOURCE: Headquarters, 1st Brigade, 101st Airborne Division

s. Defense/Use of Offensive Action.

Item: "The principle of defense through offensive operations proved highly successful.

Discussion: "In the course of a brigade operation, the frequent use of company and battalion size actions, in addition to saturation patrolling by platoon and squad size elements, effectively dominates large areas, and denies the enemy any opportunity to operate therein without being detected and destroyed. Changes in defensive positions, a diversity of offensive operations and prompt, aggressive reaction with "Hawk Flights" can keep the enemy off balance to such an extent that no coordinated attacks are possible.

Observation: "Defense of installations, bases and unit positions is best accomplished by constant, vigorous, offensive action to disrupt and destroy VC forces in the area."

SOURCE: Headquarters, 1st Brigade, 101st Airborne Division

t. Unrecorded Mine Fields.

Item: "Unrecorded mine fields are found in many parts of Vietnam.

Discussion: "In the course of the conflict in Vietnam, mines have been used by both sides. Some mine fields were put in by the French, some by ARVN units, and others by the VC. The result is a hodgepodge of mines with no identifiable pattern.

Observation: "Combat units subject to assignment to Vietnam should stress training in the detection, surveying, and clearing of mine fields."

SOURCE: Headquarters, 1st Brigade, 101st Airborne Division

u. Booby Traps and Command Detonated Mines.

Item: "The VC effectively use command detonated mines and booby traps along roads and in defense of base camps.

Discussion: "Thirty-two percent of the 1st Infantry Division casualties have been sustained from command detonated mines and booby traps. The VC uses recovered artillery shells, mines, grenades, and Air Force ordnance in establishing booby traps.

Observation: "Training must stress the requirement for constant vigilance against mines and booby traps and the necessity for continuing exploration of methods to effectively combat this VC weapon."

SOURCE: Headquarters, 1st Infantry Divisi

v. Night Operations/Night Attacks.

Item: "Night Operations.

Discussion: "During Operation NEW LIFE 165, the Brigade reinitiated a method of operation which had been used extensively in training but had not been employed on other than a limited scale since arrival in RVN. A series of highly successful night attacks were conducted which proved beyond a shadow of doubt that the night does not belong to the Viet Cong.

Observation: "Units employed in RVN should utilize night operations extensively to restrict VC activities and to search out and destroy or capture VC forces."

SOURCE: Headquarters, 173d Airborne Brigade (Separate)

w. Night Operations/Perimeter Defense.

Item: "Flares, artillery, and mortar illumination must be used with care while in a perimeter defense.

Discussion: "The untimely or misuse of illumination in the defense exposes friendly as well as enemy positions.

Observation: "The use of illumination rounds should be secondary to the employment of night surveillance devices and employed only when necessary to repel a significant probe or attack."

SOURCE: Headquarters, 1st Brigade, 101st Airborne Division

x. Night Operations/Marking of Friendly Positions at Night.

"Throughout the Pleiku - Plei Me Campaign, aerial fire support was used to repulse enemy attacks at night. In most instances, no prominent terrain feature existed that could be used to mark the friendly positions. The use of C-ration cans or artillery canisters filled with sand and saturated with fuel provided a simple method of marking the trace of friendly positions. The containers were emplaced around the perimeter and ignited on order by using a wire to ignite a trip flare over the container. The fuel could be delivered to the unit when it is re-supplied at its night location."

SOURCE: Headquarters, 1st Cavalry Division (AM)

y. Night Operations/Battlefield Illumination.

Item: "There is usually a gap in battlefield illumination when one flare ship relieves another on station.

Discussion: "When one flare ship relieves another, a period of adjustment is required. The initial flares dropped by a flare ship are not always positioned effectively. During the initial adjustment period, the enemy takes advantages of darkness to probe defensive positions.

Observation: "The ground commander must employ artillery and mortar illumination rounds until the flare ship has established its pattern. The ground commander must relay the maximum ordinate of artillery and mortar fire to the flare ship so that it may operate safely."

SOURCE: Headquarters, 1st Brigade, 101st Airborne Division

z. Long Range Reconnaissance Patrols (LLRP).

Item: "There is a need of US LRRP organizations in Vietnam.

Discussion: "Obtaining information of VC movements and locations is often the most difficult and frustrating part of any operation in Vietnam. Because of their penchant for withdrawing from and avoiding contact with US forces, our short range reconnaissance patrols are frequently unproductive. This situation presents many lucrative opportunities for the employment of Long Range Reconnaissance Patrols operating 25 to 50 Kms from friendly units. The VC, thinking them-

selves safe from immediate contact with US forces, tend to use less care and caution than normal and can be observed as they assemble or move; subsequent operations can then be planned to destroy them. Such operations normally enjoy the advantage of surprise. Our own LRRP has been used extensively and has been very sucessful in detecting and reporting VC activity and movement.

Observation: "US units in Vietnam should organize and employ an organic Long Range Reconnaissance Patrol."

SOURCE: Headquarters, 1st Brigade, 101st Airborne Division

aa. Water-borne Patrol.

Item: "Water-borne Patrol.

Discussion: "During Operation NEW LIFE '65, the Brigade's first water-borne long range patrol was conducted. Engineer assault boats, powered by outboard motors, were utilized. Personnel making the patrol were extremely well armed to offset the relative vulnerability of the boats in open water. Much valuable information was gathered about the conditions of the stream banks and possible crossing sites and numerous caves and possible VC hiding areas were located.

Observation: "Men who are well armed and willing to fight can effectively patrol the waterways of RVN."

SOURCE: Headquarters, 173d Airborne Brigade (Separate)

bb. Search and Destroy Operations in Inhabited Areas.

"Search and destroy operations where VC and innocent women and children are intermingled contunues to be a problem. If an operation is imminent, women and children normally hide in holes for protection against artillery and small arms. In areas where innocent personnel are involved, interpreters should call into the holes before clearing them. Smoke and/or CS have proved effective in clearing holes and tunnels; small arms and automatic weapons are not particularly suitable."

SOURCE. Headquarters, 1st Cavalry Division (AM)
(Extracted from a special report.)

cc. Search and Destroy/Sweep Tactics.

Item: "Conduct of the sweep attack in small areas.

Discussion: "A slow and methodical attack in small areas has allowed the withdrawing VC forces ample time to emplace mines and booby traps in front of advancing troops.

Observation: "The attack must be conducted rapidly to destroy the VC. The attack may be followed by a thorough search of the area for base camps and installations."

SOURCE: Headquarters, 1st Infantry Division

dd. Tunnel Warfare/Tunnel Exploitation Team.

Item: "Use of tunnel exploitation and denial teams.

Discussion: "The discovery and destruction or denial of VC tunnels presents a major problem to tactical commanders during the conduct of operations. The exploitation of located tunnels provides valuable intelligence.

Observation: "Tunnel teams should be selected, trained and equipped at company level to exploit and destroy tunnels. "

SOURCE: Headquarters, 1st Infantry Division

ee. Tunnel Warfare/Tunnel Destruction and Denial.

Item: "Destruction or denial of tunnels and fortifications.

Discussion: "The VC utilized tunnels and fortifications to great advantage. Many tunnels are elaborate with up to three levels of construction and have been constructed as early as 1954. The entrances are well camouflaged and may be overgrown with brush, located under a hut or cooking pot. Many have been discovered as a result of air strikes and artillery fires which dislodged the camouflage.

Observation: "To completely destroy tunnels is time consuming and requires vast amounts of explosives. As an alternative, the tunnel entrances have been blown and in some cases, the interior seeded with riot control agents. Tank dozers have been used successfully for the destruction of tunnels,

bunkers, and trenches. Training is required in locating and destroying or denying the use of tunnel complexes."

SOURCE: Headquarters, 1st Infantry Division

ff. Tunnel Warfare/Tear Gas.

Item: "Tear Gas.

Discussion: "Tear Gas has been used by this unit on numerous occasions to ferret VC or friendly Vietnamese personnel from tunnels, bunkers, or caves.

Observation: The use of Tear Gas has saved many lives on both sides, and should be continued."

SOURCE: Headquarters, 173d Airborne Brigade (Separate)

7. Police Operations.

a. Military Police Armament.

Item: "Selection of Proper Weapon for Defense Against Terrorist Attacks.

Discussion: Military Police performing static security and motorized patrols in the Saigon/Cholon/Tan Son Nhut area have been engaged in fire-fights with Viet Cong Terrorists. These terrorists are often armed with 7.62 mm automatic weapons. These fire-fights usually occur during a VC attempt to destroy a US installation or billet by driving an explosive laden vehicle into the installation and setting off the explosive. The Military Police must have the capability of achieving and maintaining fire superiority; and hitting and stopping an explosive laden vehicle before it reaches the building. This requires automatic fire which has the capability of piercing a vehicle. The battalion tested the 12 gauge shotgun, the .45 Cal. "greasegun" (M3A1), the M-14 rifle and the 5.56 mm, XM16-E1 rifle. Fire superiority could not be obtained with the shotgun because of the limited number of shells capable of being loaded in the weapon and the difficulty in loading it. Also, the buckshot did not have the penetrating power necessary to stop a vehicle. Fire superiority could be achieved with a submachine gun, but it lacks the penetrating power necessary to stop a vehicle. The M-14 rifle and the XM16-E1 rifle filled all of the requirements; however, the weight of the M-14 makes it less desirable than the XM16-E1.

Additionally, the M-14 is difficult to control when firing automatic fire from the standing or crouched position, which is the position the Military Policeman engaged in a fire-fight would shoot from. The XM16-E1 does not have this limitation. Measures have been taken to obtain XM16-E1 rifles for the battalion.

Observation: XM16-E1 rifle should replace the M-14 as the basic weapon for Military Police and be issued to the battalion as soon as they become available.

SOURCE: Headquarters, 716th Military Police Battalion

b. Physical Security.

Item: "Physical Security.

Discussion: "Although this lesson was not learned through error, it became increasingly clear in September and October 1965 that a security force was necessary if we were to establish and develop this logistic complex in a somewhat hostile environment. Fortunately, the 2d Infantry Brigade was located within one mile of the Long Binh nucleus. This brigade provided the security umbrella which enabled Long Binh to establish itself. Without that security shield, certainly the development of the Long Binh Logistic Complex would have been retarded and productively decreased.

Observation: "A security force is necessary to protect any complex in an active guerrilla environment, especially during its early development."

SOURCE: Headquarters, 60th Ordnance Group (M&S)

c. Long Binh Sub-Area Development.

Item: "Long Binh Sub-Area Development.

Discussion: "From the outset, in September 1965, master planners were faced with the task of "selling land" to arriving units that were located in the interior as opposed to frontage property along Highway 1A. Two factors stand out that prevented the development of the interior. First, the lack of an interior road net effectively halted the development of the interior, thereby prohibiting the orderly development of the entire Long Binh Logistic Complex. Secondly, prospective tenants generally opposed the idea of moving into the interior because of the insecure status of the interior tract.

These factors, combined, forced the Long Binh Development to be generally confined to the property along Highway 1A.

Observation: "That orderly development of a Logistic Area in a hostile environment should have been preceded and accompanied by interior road construction and accompanied by a security force. The lack of both, placed a serious limitation on the master planning for the Long Binh Sub-Area."

SOURCE: Headquarters, 60th Ordnance Group (M&S)

d. Physical Security of Ammunition Depots.

Item: "Physical security of ammunition depots.

Discussion: "Experience has shown that the large size of ammunition depots, and the inherent fluctuation of secure areas within a counter-insurgency combat zone render ordnance ammunition units incapable of providing adequate physical security for ammunition facilities without seriously detracting from the unit mission capabilities.

Observation: "Ammunition battalions operating ammunition depots within a combat zone must be augmented with, a minimum of, one security company to provide adequate physical security for their ammunition facilities."

SOURCE: Headquarters, 3d Ordnance Battalion (Ammunition)

e. Construction Security.

Item: "Construction security in a combat zone.

Discussion: "Construction in a combat zone, especially a zone in which there is no definite front, presents many security problems to the Construction Battalion. The internal security of the battalion compound requires approximately 7000 man hours a week or the equivalent of two platoon weeks. In addition to this security requirement, armed guards are required to accompany all convoys hauling construction materials from supply yards at Cam Ranh Bay or Nha Trang to Phan Rang, Republic of Vietnam. Under normal circumstances, the security requirements placed upon the Construction Battalion 'drains off' approximately one fourth of the construction capability of the unit. As noted in section 5e of the Quarterly Command Report, dated 8 January 1966, additional construction time is lost

due to inadequate external security of the construction area. The result of the security requirements placed on a Construction Battalion is a longer lead time required for critical construction projects.

Observation: "Engineer Construction Battalions should be augmented with security force of sufficient strength to provide internal security for the contonement area and armed guards for convoys. Also, the external security should be of sufficient strength to adequately secure construction sites and critical facilities from infiltration, sabotage, and attack so that 24 hour construction can continue."

SOURCE: Headquarters, 62d Engineer Battalion (Construction)

f. Communication.

Item: "Communication.

Discussion: "Communications between noncontiguous units in Long Binh were difficult to maintain because we relied entirely on land lines. Heavy truck traffic, which characterizes a logistic service area, and heavy construction equipment, which saturated Long Binh in its early development, disrupted communications by breaking the wire. Oftentimes, coordination between units that found themselves being probed by the VC was impossible.

Observation: "Had a Security-Coordination-Package composed of a battalion of infantry and a close support signal company been organized, and been in the vanguard as the Long Binh logistic complex was constructed, much of the sensitive security problem would have been eliminated. Development could therefore proceed unimpeded by guerrilla activity."

SOURCE: Headquarters, 60th Ordnance Group (S&M)

g. Depot Security.

Item: "Reduction of pilferage.

Discussion: "Security of depot supplies and equipment posed a problem. Extensive use of concertina wire and barbed wire fences did not prevent individuals from entering the depot under the cover of darkness. Therefore, action was taken to install lighting around the depot perimeter,

to place 24-hour guards at critical areas for direct observation of supplies , and to implement a security patrol. Tighter security measures were taken by placing gate guards at the two entrances to the depot and implementing a pass system allowing only persons with genuine business to enter. The gate guards check the outgoing vehicles for paperwork authorizing removal of supplies from the depot.

Observation: "The chances of pilferage have been greatly reduced by the implementation of these security measures."

SOURCE: Headquarters, 98th Quartermaster Battalion (GS)

h. Military Police Escort Vehicles.

Item: "Military police vehicles should be equipped with pedestal mounted machineguns.

Discussion: "Military Police units providing highway traffic motor patrols and convoy escort duties on highways in Vietnam are frequently the first vehicles to travel the highways at the beginning of the day, and the last vehicles to travel the highways at the end of the day. Therefore, these vehicles become prime targets for the Viet Cong.

Observation: "At least 20 percent of the authorized TO&E M-151 vehicles be equipped with pedestal mounted machineguns. These weapons would greatly enhance the effectiveness of these units when encountered by the Viet Cong."

SOURCE: Headquarters, 504th Military Police Battalion

8. Communications.

a. Radio Operations.

Item: "Radio communication and radio operators.

Discussion: "Units in Vietnam rely almost exclusively on radio communications during combat operations. To avoid confusion and

delay, and in order to insure that orders and reports are transmitted clearly and quickly, highly trained radio operators are essential. Transmissions must be brief, yet complete; maximum use should be made of the "point of origin" system and brevity codes. Operators should be highly motivated, and inbued with a sense of responsibility and an awareness of the importance of their contribution to the successful accomplishment of any mission.

Observation: "Well trained, highly motivated radio operators are essential to operations in Vietnam."

SOURCE: Headquarters, 1st Brigade, 101st Airborne Division

b. Communications Security.

Item: "Communications security.

Discussion: "Communications security is greatly jeopardized when units arrive in country without sufficient quantities of low level operations codes and authentication/numeral codes. The lead time for supply of NSA produced codes is 90 - 120 days.

Observation: "All units deploying to this theater should depart home station with a sufficient supply of codes to sustain their requirements until automatic distribution can be established."

SOURCE: Headquarters, I Field Force Vietnam

c. Radio Frequencies.

Item: "Efficient use of radio frequencies.

Discussion: "Because of the limited number of frequencies allocated to US and FWMAF, frequency allocation and control was initially exercised at Army level. Subsequent delegation of this authority to Field Forces, Vietnam improved reaction time in assigning frequencies to tactical units. However, the limited number of frequencies to FFORCEV prohibits allocation of blocks of frequencies to subordinate units.

Observation: "Frequency allocation and control should be delegated to the lowest possible headquarters consistent with the number of

frequencies available.

SOURCE: Headquarters, I Field Forces Vietnam

d. Maintenance of Radio Hand Sets.

Item: "Radio hand sets require climatic protection.

Discussion: "The humid climate of Vietnam and the necessity for conducting operations through rice paddies and across jungle swamps and streams will result in defective radio hand sets unless proper protective measures are taken.

Observation: "Use of plastic bags from radio batteries over radio hand sets will assist in keeping the hand set dry. There is little distortion resulting from this practice. Moisture shields for the hand set should be changed every few days using material from a plastic battery cover."

SOURCE: Headquarters, 1st Infantry Division

e. AM Radio.

Item: "Doublet Antenna.

Discussion: "When using a doublet antenna it must be cut exactly to the length corresponding to the frequency used or resistors will burn out in the final loading stage of the transmitter.

Observation: "Units and personnel should be made aware of this problem."

SOURCE: Headquarters, 23d Artillery Group

f. Radio/VHF.

Item: "The configuration of Mobile Radio/VHF communications equipment currently authorized is unsuitable for employment in many areas.

Discussion: "Mobile communications equipment such as the AN/MRC-54, AN/MRC-69, AN/MRC-73 and AN/MCC-6, mounted on 2½ ton trucks, present movement problems in Vietnam. Since control of road networks by friendly forces is generally restricted, these equipments usually must be airlifted to operational sites in support of tactical operations. Because of their size, these configurations require large aircraft (C-130 type) and special handling equipment for loading and off-loading. Deployment flexibility is accordingly hampered.

Observation: "Every effort should be made to provide lighter, smaller and more transportable mobile communications equipment. AN/GRC-106, AN/GRC-108 and AN/TRC-108 type equipment, mounted in 3/4 ton truck, are desired replacements for current equipment."

SOURCE: Headquarters, I Field Force Vietnam

g. Retransmission Cable Kit.

Item: "Employment of retransmission cable kit, HK-456/GRC.

Discussion: "Frequently during combat operations, units have no ground station in forward areas capable of automatic retransmission. The Retransmission Cable Kit, HK-456/GRC may be employed with two AN/PRC-25 radios to provide a lightweight, portable ground station, capable of automatic retransmission.

Observation: Units equipped with the Radio Set, AN/PRC-25 should initiate action to obtain Retransmission Cable Kit, HK-456/GRC since it is not normally an item authorized by TOE."

SOURCE: Headquarters, I Field Force Vietnam

h. Radio Set AN/GRC-46B.

Item: "Modification of Radio Set AN/GRC-46B.

Discussion: "Since all RATT operations in Vietnam must be secure, the need exists for all radio teletype sets to be able to accept the TSEC/KW-7. Several units arrived in-country with unmodified AN/GRC-46B radio teletype sets. Modification kits are not presently available in the theater.

Observation: "Units deploying to this theater should insure that modification of AN/GRC-46B is accomplished prior to departure from home station."

SOURCE: Headquarters, I Field Force Vietnam

NOTE: For additional items on communications see Appendix III.

9. Training.

a. Training/Emphasis Toward Helimobile Operations.

Item: "Airmobile Operations.

Discussion: "Every major operation has been characterized by the use of helimobile displacement of artillery, aerial resupply, use of airborne command and control ships, and aerial medical evacuation. These techniques are used extensively, and parachute operations infrequently (none to date by US airborne units).

Observation: "A need exists to change the present training emphasis for airborne units from parachute operations to helimobile operations."

SOURCE: Headquarters, 1st Brigade, 101st Airborne Division

b. Training/Contact with the Enemy.

Item: "Maintaining contact.

Discussion: "Once contact has been made, it must be maintained to keep the enemy off balance. The VC are well versed in the use of delaying tactics. The combat leader must be able to determine rapidly the size force he has engaged. The time lost in developing the situation may allow the main force to prepare an ambush, occupy defensive positions, or escape.

Observation: "All training situations must stress the importance of gaining and maintaining contact with the enemy. Rapid reporting of intelligence information will permit faster friendly reaction."

SOURCE: Headquarters, 1st Infantry Division

c. Training/Long Range Patrols.

Item: "Long range patrols.

Discussion: "US infantrymen, with limited additional training and using organic unit resources, have successfully conducted long range reconnaissance patrol operations. The nature of the enemy and terrain in Vietnam necessitates long range ground reconnaissance activities as a means of finding the enemy or confirming their nonexistence.

Observation: "Since timely and positive intelligence information can be obtained by long range reconnaissance patrols, patrolling should be emphasized in individual and small unit training."

SOURCE: Headquarters, I Field Force Vietnam

d. Training/Land Navigation.

Item: "Land navigation in jungle areas.

Discussion: "Land navigation is extremely difficult, especially in jungle areas, due to the absence of prominent terrain features and inaccuracies in maps.

Observation: "All personnel must attain a high degree of proficiency in the use of the "pacer and compass team" techniques which have proven effective."

SOURCE: Headquarters, 1st Infantry Division

e. Training/Night Combat Training.

Item: "Night operations.

Discussion: "Prior to arrival of the US units in Vietnam, the Viet Cong had almost complete freedom of movement at night. Very few night operations were conducted by ARVN forces. This brigade initiated several night infiltration operations shortly after arrival which threw the VC into a state of confusion and caused them to be unsettled for many days thereafter. Night operations are now the norm for this unit. The results are: (1) Reducing casualties by fighting or moving

under cover of darkness; (2) Gaining surprise over the VC; and (3) Destroying freedom of movement previously enjoyed by the enemy. Maximum use should be made of night observation devices to fully exploit our technological advantage.

Observation: "Emphasis should be placed on training for and conduct of night combat operations in Vietnam."

SOURCE: Headquarters, 1st Brigade, 101st Airborne Division

f. Training/Night Operations.

Item: "Night operations.

Discussion: "Night operations are difficult due to lack of familiarity of the terrain, adverse psychological effects of the darkness, and difficulty of control. Well planned and executed night operations are necessary to pursue a located enemy force, maintain contact, and prevent freedom of movement of the enemy forces during the hours of darkness.

Observation: "Units must be well trained in and conduct night operations."

SOURCE: Headquarters, 1st Infantry Division

g. Training/Communications Security.

Item: "Communications security in radio/telephone procedures.

Discussion: "The VC utilize captured US FM radio sets for their own traffic and for gathering intelligence. VC transmissions in English requesting such actions as withdrawal of friendly forces and lifting of friendly fires have been monitored. Emphasis on the proper use of codes, and adherence to correct security procedures will neutralize VC intelligence gathering through this medium.

Observation: "Personnel must be thoroughly trained in radio/telephone procedures with emphasis on communications security and the use of proper codes."

SOURCE: Headquarters, 1st Infantry Division

h. Training/Village Search Techniques.

Item: "Most operations include the entry and search of villages and hamlets.

Discussion: "Mock VC villages similar to the one located at the Special Warfare Training Center, Fort Bragg, should be constructed at other training areas throughout CONUS. These mock villages should be complete with punji pits, tunnels, bunkers, and secret hiding places. The surrounding area should simulate the rice paddies and dikes common to most villages in Vietnam. The approach trails should have simulated booby traps and man traps. Intensive training should be conducted on methods and techniques of clearing and searching these villages.

Observation: "Training and proficiency in village search techniques is one of the most important military skills required of our troops in Vietnam."

SOURCE: Headquarters, 1st Brigade, 101st Airborne Division

i. Training/Battlefield Police.

Item: "Battlefield police of weapons and equipment.

Discussion: "The VC habitually collect weapons and equipment left on the battlefield.

Observation: "Training must be conducted to insure that all personnel are thoroughly indoctrinated on the importance of battlefield police."

SOURCE: Headquarters, 1st Infantry Division

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Section II

A SUMMARY OF LESSONS LEARNED
IN
"COMBAT SUPPORT OPERATIONS"

1. General Observations

a. Fire Support Coordination.

Item: "Fire support coordination.

Discussion: "It is not unusual to have artillery firing from four different directions on an objective area. Coordination is further complicated by many helicopters and high performance aircraft operating in the area. Coordination of timely and accurate fires is extremely complex.

Observation: "The division publishes in the operations order a schedule for artillery fires, TAC fighter strikes, and gunship strikes. Flight corridors are established for airmobile operations. In addition, fire coordination personnel are co-located with a centralized air control facility to provide warnings to all aircraft. Warnings of artillery fires are broadcast over specified UHF, VHF, and FM frequencies using as a reference a common grid system published in the operations order."

SOURCE: Headquarters, 1st Infantry Division

b. Coordination of Aircraft and Artillery.

Item: "The number of aircraft utilized during operations in Vietnam complicates the safe firing of artillery.

Discussion: "The best solution for control of aircraft and artillery is for all units in the landing zone, and all aircraft entering or leaving the zone to operate on a common air-ground frequency, controlled by a pathfinder team. Mutual clearance of artillery and aircraft is obtained, and resupply aircraft are directed to their proper holding area. In addition, pilots are gaining confidence in being able to fly under and adjacent to the artillery projectile. During one operation, C Battery fired continuously for almost three hours, and maintained continuous fire for one and one half hours. In addition, the other battery in the area fired during this period. HU-1 and OH-13 helicopters were able to enter and leave the landing zone by careful air control procedures.

Observation: "Utilizing pathfinders with units concerned monitoring the air-ground frequency, optimum artillery fire can be effected without endangering aircraft."

SOURCE: Headquarters, 2nd Howitzer Battalion, 17th Artillery

c. Reconnaissance and Observation.

Item: "Combat reconnaissance and observation.

Discussion: "Ground observation and reconnaissance has proven ineffective in the flat and jungle terrain in this units area of observation. Aerial observation and reconnaissance is the primary means of finding and adjusting artillery on the VC. Day operations are hampered because of the intermingling of the VC with friendly natives on the trails and roads and in the fields. Experience has proven that observers can, after a period of time, determine when daylight VC moves are made. This capability occurs after an observer gets to know the day to day normal activity in the area. Any increase in activity usually indicates a VC move. 1500 feet has been selected as the normal daylight observation level although depending on the enemy activity, observation is conducted from just above the surface to 2500 feet. Night observation is conducted in an area receiving increased attention. Numerous targets have been detected by night aerial observation mainly along supply routes and river crossings. Also base camps have been detected by observation of smoke coming from tree lines during hours of darkness. A technique of working with flare ships (either C-46's or C-47's) and artillery illumination has resulted in destruction of a number of targets. Night observation is normally done between the altitudes of 1000 to 3000 feet although on clear nights reconnaissance on roads, trails and rivers has been made at 100 feet. A night observer can be effective only if he is intimately familiar with the terrain in day time. Aerial night observation in rotary wing aircraft has been found to be very ineffective.

Observations: (1) "Ground observation is of secondary importance when operating in flat terrain or in the jungle.

(2) "Observers must fly over the same area for many days before they become effective in detecting VC movement in daylight.

(3) "Best observation altitude is 1500 feet with higher and lower altitudes used as the mission dictates. Four aircraft were hit in a three week period while making low passes over known hostile forces.

(4) "To be effective, night observers must first become familiar in detail with the terrain during daylight.

(5) "Known routes of communication can be harassed and interdicted through effective use of night observation."

SOURCE: Headquarters, 23d Artillery Group

d. Armored Cavalry Employment.

Item: "Employment of armored cavalry in Vietnam.

Discussion: "Problem areas encountered by armored cavalry units include:

(1) "The command detonated mine.

(2) "Vulnerability of personnel riding in light vehicles and APC's to mines.

(3) "Vulnerability to mortars and recoilless rifles.

Observations: (1) "The best defense against the command detonated mine is speed, reconnaissance of suspected areas, and avoidance of trails and roads.

(2) "Proper placement of sand bags reduces the vulnerability of personnel, riding in light vehicles and APC's, to injuries from mines.

(3) "Selection and judicious use of track vehicle primary and supplementary firing positions reduces the vulnerability of these vehicles to mortar and recoilless rifle fire."

SOURCE: Headquarters, 1st Infantry Division

e. Close Air Support.

Item: "Use of SAC B-52's for Close Air Support.

Discussion: "SAC B-52 bombers can deliver accurate and heavy fire power in direct support of division and brigade operations. The B-52 force has the advantage of mass, surprise and shock action. A large area can be attacked in a few minutes by planes too high to be heard. They can be used at night or in poor weather when tactical air is limited. The force

can be based outside the combat zone, thereby reducing theater logistical problems The most serious limitations are the small size of the force, which necessitates priority assignments at theater level and the long lead time, 24 hours or more, to get target approval, brief the crews, ready planes and fly to the target.

Observation: "Initial operational planning should provide for the use of this force with conventional ordnance."

SOURCE: Headquarters, I Field Force Vietnam

2. Army Aviation.

a. Vectoring Aerial Rocket Artillery.

"During recent combat operations, target location was given to the aerial rocket artillery with reference to direction of flight. This method was found to be unsatisfactory in that the pilot was reacting to external commands and had no way to orient himself in relation to the target. A more effective procedure developed to locate the target was to select a distinct terrain feature and give the pilot an azimuth and distance from the feature. In the absence of a distinct terrain feature a smoke grenade can be used."

SOURCE: Headquarters, 1st Cavalry Division (AM)
(Extracted from a special report.)

b. Lightened Load for Airmobile Operations.

Item: "Due to aircraft weight capacities, units often are required to accomplish their mission with minimal equipment.

Discussion: "Any means to reduce the weight of equipment is desirable. Shields have been removed from the howitzers, and a minimum of section equipment is carried. Sections share equipment. Each person is limited to one waterproof bag, or one duffel bag per two personnel. Only radio vehicles and mules are airlifted into the landing zones. External land lines are used only in rare circumstances; radios are used almost exclusively. Due to the jungle canopy, antennas must be raised. Bamboo poles with wire (WD 1/TT) lead-in have overcome the reduced range caused by the jungle canopy. The older series of radios have shown they do not possess the needed range. Tentage is limited to small, lightweight, general purpose

tents, and canvas tarps for troops and equipment shelters. The basic concept is "if we don't need it, don't take it.

Observation: "By properly screening equipment, thereby employing only required items, airmobile operations can be accomplished with minimum equipment."

SOURCE: Headquarters, 2d Howitzer Battalion, 17th Artillery.

c. Variable Load Capabilities for Cargo and Utility Helicopters.

"Density altitudes in excess of 3000 feet and higher reduces considerably the maximum allowable loads. For example, a CH-47 departing An Khe (1500 feet) to Qui Nhon (sea level) can safely transport 9000 pounds. The same aircraft departing An Khe to Pleiku (2500 feet) can safely transport 7000 pounds. All UH-1D and CH-47 ACL's must be recomputed, for each area of operations, and disseminated. The CH-47 will reflect an ACL of 7000 - 9000 pounds, depending on fuel requirement, and the UH-1D 5 to 7 combat troops or 1200 to 1680 pounds, depending on fuel load requirement and expected density altitudes at landing site."

SOURCE: Headquarters, 1st Cavalry Division (AM)
(Extracted from a special report.)

d. Airfield Operations.

Item: "Airfield Facilities.

Discussion: "Aircraft of this group generally operate from airfields run by other units, although occasionally a battalion may have its own strip. The increasing number of aircraft found in a division today has caused serious problems in air traffic control and has pointed up the deficiencies in airfield facilities. An area particularly affecting observation aircraft is the lack of lighted airstrips for night operations. Flare pots, headlights, landing under mortar illumination have all been used, but they are unsatisfactory substitutes for basic airfield requirements. Airfield operating detachments, with the sole mission of running airfields, appear to be the solution to meet the requirements of all the variety of units that would operate from the airfield. Each AOD would be equipped to provide all weather day-night operations

and air traffic control.

Observations: (1) "All weather day-night airfields are required to sustain around-the-clock operations.

(2) "Individual units are not geared to operate airfields.

(3) "Separate detachments should be formed with the sole mission of running airfields.

(4) "At least four fixed-base airfields are required in a division area in order to accomodate effective and responsive aircraft support by Army/Air Force cargo aircraft."

SOURCE: Headquarters, 23d Artillery Group

e. Excessive Helicopter Commitments.

Item: "Excessive helicopter commitments.

Discussion: "Extended commitment of airmobile companies in combat operations, particularly away from home base, causes marked increase in the numbers of aircraft down for maintenance. This can be attributed to:

(1) "Distance from "hard" maintenance base.

(2) "Limited maintenance capabilities at staging fields.

(3) "Extensive and excessive use of aircraft without allowing for maintenance time.

(4) "Aircraft operating under adverse sand and dust conditions.

(5) "Utilization of helicopter transmissions that could be accomplished by other means.

Observation: "Commanders at all levels must utilize helicopters judiciously in order to obtain maximum capability for combat lifts. This should include, as a minimum, the provision of time for maintenance and the use of helicopters only for those missions that cannot be accomplished by other means."

SOURCE: Headquarters, I Field Force Vietnam

f. Helicopter Rotor Blades.

Item: "Abrasion of helicopter rotor blades.

Discussion: "The operation of UH-1 series of helicopters in the sandy environment along the coastal regions of Vietnam creates an abrasion problem with main and tail rotor blade leading edges often requiring premature replacement. Main rotor blades have required replacement upon the accumulation of 284 flying hours, as opposed to normal replacement time of 2500 hours. Application of vinyl tape, as outlined in TM 55-1520-210-20, to the leading edge of main rotor blades has not been effective in the reduction of abrasion.

Observation: "To reduce abrasion, take-off's and landings should not be accomplished from a hover when operating in sandy areas."

SOURCE: Headquarters, I Field Force Vietnam

g. Lubrication Requirements.

Item: "Army aircraft lubrication requirements.

Discussion: "The sandy environment along the coastal regions of Vietnam, coupled with the monsoonal rains, creates the requirement for more frequent lubrication of bearings and changing of aircraft engine oil, if premature failure of components is to be avoided. Daily or after each flight, purging of aircraft bearings, with particular emphasis on drive systems, is necessary. Engine oil changes are required at one-half the interval specified in aircraft manuals.

Observation: "Aviation units should stress preventive maintenance and frequent engine oil changes for all aircraft."

SOURCE: Headquarters, I Field Force Vietnam

h. Use of Forward Contact Teams.

"Recent operations have shown that demand maintenance (unscheduled maintenance which requires prompt attention) can be reduced considerably by providing direct support capability on site. Demand maintenance is normally carried forward on the DA Form 2408 when a unit is separated from its direct support element. A definite requirement exists for a direct support maintenance team, with a sophisticated 'fly away' kit, to travel with the aircraft any time battalion size lifts are out in excess of three days. This team should be readily available at the forward site. For company and platoon size lift operations, only a contact team need be provided at the forward support site."

SOURCE: Headquarters, 1st Cavalry Division (AM)
(Extracted from a special report.)

i. Propeller Life.

Item: "Propeller life.

Discussion: "When operating into or out of unimproved airstrips, where gravel and small stones may be present, it has been found that approximately every 200 to 300 hours a new propeller is needed. This is due to chipping and wear of the propeller by stones, gravel, and other debris."

Observation: "Close and continuous inspections of propellers should be made and they must be replaced as needed. Stockage levels should be adjusted to meet increased demand."

SOURCE: Headquarters, 41st Signal Battalion (Combat Area)

j. Console to Pedestal Bracket Cracking.

Item: "Console to Pedestal Bracket Cracking.

Discussion: "It has been found that, at between 200 and 300 hours of operatic the bracket between the pedestal and console on helicopter UH-ID, develops a hairline crack. If this crack is not stop-drilled upon discovery, it will widen and cause additional maintenance.

Observation: "Frequent and detailed inspection of said bracket should be conducted and action taken to prevent excessive cracking."

SOURCE: Headquarters, 41st Signal Battalion (Combat Area)

k. Seal and Bearing Wear.

Item: "Seal and Bearing Wear.

Discussion: "Helicopter power cylinder and servo seals, 90° and 45° gear box seals, blade grip seals, and seals in engine oil reservoir have decreased life. Rotating bearings on the main and tail rotor systems also have reduced life. This is due to the extremely dusty conditions under which helicopters operate. Close and continuous inspection by crew chiefs, pilots, and maintenance personnel is necessary to detect excessive wear.

Observation: "Stockage levels of seals and rotating bearings should be reviewed and adjusted in anticipation of high usage factors. All new pilots, crew chiefs, and maintenance personnel coming to Vietnam should be made cognizant of the excessively dusty conditions and the problems presented by the conditions."

SOURCE: Headquarters, 41st Signal Battalion (Combat Area)

l. Fouled Spark Plugs and Fuel Contamination.

Item: "Fouled Spark Plugs and Fuel Contamination.

Discussion: "It has been found that spark plugs fouling in reciprocating engines has been occurring due to water and contamination of 115/145 guel. This fuel is transported to this area in 55 gallon drums and, although accepted filtering processes are practiced, much of the fuel remains contaminated due to field conditions. This contamination results in spark plug fouling.

Observation: "Proper fuel filtering must be practiced. Stockage levels of spark plugs should be reviewed and adjusted to compensate for a high usage factor."

SOURCE: Headquarters, 41st Signal Battalion (Combat Area)

m. Cargo Handling.

Item: "External Rigged Loads for the CH-47 Helicopter.

Discussion: "Utilization of the CH-47 helicopter, with internal loads for unit resupply in hostile areas, often produced unsatisfactory ground time.

Observation: "The use of externally rigged loads will allow utilization of a greater cargo load for the CH-47 without producing an unsatisfactory ground time."

SOURCE: Headquarters, 173d Airborne Brigade (Separate)

n. Roller Conveyor System.

Item: "Roller Conveyor System in the CV-7 Aircraft.

Discussion: "The roller conveyor system in the CV-7 aircraft is inadequate for normal combat loads. Installation of the skate wheel conveyor system will alleviate the problem.

Observation: "The skate wheel conveyor system should be installed in all CV-7 aircraft utilized for cargo transport."

SOURCE: Headquarters, 173d Airborne Brigade (Separate)

o. Pre-palletized Loads.

"Recent operations pointed out the importance of having supplies pre-palletized. For example, the normal loading time for 200 rounds of 105mm ammunition was approximately one hour. The same load pre-palletized could have been loaded internally in a CH-47 in twenty minutes. As a result, pallet loads are prepared in advance, with a maximum of 1200 pounds, so they may be carried by either UH-1D or CH-47 helicopters. Pre-palletized loads are made up for delivery to battalion, company and platoon size units."

SOURCE: Headquarters, 1st Cavlary Division (AM)
(Estracted from a special report.)

3. Artillery Support.

a. Preplanned Artillery Fire.

Item: "Preplanned artillery fire.

Discussion: "The accurate and timely delivery of artillery fire on preplanned concentrations has proven to be an effective deterrent to ambushes and attacks as well as inflicting costly casualties on the

enemy. As a minimum, artillery fires should be preplanned to:

(1) "Dislodge or disrupt the enemy from suspected or probable ambush sites.

(2) "Give direction to infantry patrols, by either sound or by observation.

(3) "Provide continuous security for convoys.

Observation: "Commanders at all levels should insist that timely and accurate fires are available through the use of preplanned concentrations."

SOURCE: Headquarters, I Field Force Vietnam

b. Artillery Fire Technique in Support of Ground Movement.

"Recent operations conducted in the Pleiku area revealed the potential of artillery in dispersing or preventing possible ambushes and assisting personnel to maintain direction while moving through dense terrain. The use of artillery fires to probe suspect enemy positions allows our forces to gain definite intelligence with minimum exposure of friendly personnel. WP or HE air bursts were particularly useful to the companies in maintaining a fix on its location and direction."

SOURCE: Headquarters, 1st Cavalry Division (AM)
(Extracted from a special report.)

c. Mutually Supporting Artillery Fires.

"The importance of having mutually supporting artillery positions became evident during the Chu Pong and Ia Drang Valley campaigns when two artillery positions were attacked. On an LZ surrounded by dense vegetation, the 105mm howitzer cannot be used in the direct fire role without causing extensive friendly casualties to security forces. On several occasions, it was necessary to organize the artillery into four batteries rather than the customary three to attain proper mutual support."

SOURCE: Headquarters, 1st Cavalry Division (AM)
(Extracted from a special report.)

d. Limited Control Element in Lieu of Entire Headquarters on Airmobile Operations.

Item: "On airmobile operations, due to limited transportation capabilities, the employment of the entire headquarters is usually not feasible.

Discussion: "When employed using the airmobile concept, personnel and equipment are reduced to the minimum essential to accomplish the mission. A command and control element accompanies the firing batteries and consists of three ¼ ton vehicles and the Battalion Commander's vehicle. Personnel are limited to approximately twenty-five and include the S-3, an assistant S-3, two operations NCO's, four RTO's, one survey NCO with two EM, one commo NCO with one to three EM, a S-4 representative, two medics, a fire direction officer, chief computer and five to seven fire direction personnel.

Observation: "Use of a limited control element is desirable in airmobile operations and does not adversely affect the accomplishment of the mission."

SOURCE: Headquarters, 2d Howitzer Battalion, 17th Artillery

e. Simultaneous Ground and Aerial Observation.

"In rugged or heavily wooded terrain ground observers frequently encounter difficulty in locating and adjusting the initial rounds. The aerial observer cannot always see the target. If both observers are monitoring the same radio frequency, desired results are most efficiently obtained by combining the capabilities of both observers. The aerial observer "walks in" the initial fires until the ground observer can assume control for the close-in adjustment."

SOURCE: Headquarters, 1st Cavalry Division (AM)
(Extracted from a special report.)

f. Survey.

Item: "Map Distortion.

Discussion: "Present maps of South Vietnam have some distortion. When time permits, it is advisable to register in all quadrants with the same piece, concurrent with meters and compare, e. g., faults in the map may become apparent as a drastic change in VE in a particular quadrant."

Observation: "Units should be made aware of the problem. This is another reason for units having valid VE's prior to deployment to Vietnam."

SOURCE: Headquarters, 23d Artillery Group

g. Position and Target Area Survey.

Item: "Position and Target Area Survey.

Discussion: "Target survey is not feasible at this stage of the battle. Position survey is made by assuming control from map inspection of a prominent feature that can be located on both the map and ground. Direction is determined from sun shots or polar observation - usually sun shots.

Observation: "Survey personnel should be aware of this limitation and trained in taking sun shots."

SOURCE: Headquarters, 23d Artillery Group

h. Location of Battery Positions Without Surveys.

Item: "Many areas of Vietnam lack usable survey control points.

Discussion: "Due to the lack of survey control, three and four point graphical resection has been used to determine the battery center or battalion SOP. One of the resected rays is used as an orienting line. When survey control has been brought in, the direction and location has been found to be about three to five mils and 20 to 40 meters in error. The azimuth gyroscope has been found to be erratic when used in the vicinity of helicopters, and is only added weight for airmobile operations.

Observation: "Graphical resection, both for location and direction, has been an acceptable solution to lack of survey control."

SOURCE: Headquarters, 2nd Howitzer Battalion, 17th Artillery

i. Establishing Battery Location Without Survey or Resection.

Item: "Certain LZ's, used as gun positions, are surrounded by high jungle canopy and rule out the use of resection for determining battery center.

Discussion: "Establishing an accurate location, when positioned in a landing zone surrounded by high jungle canopy, has been solved by registering on two zone identifiable map inspection points 1600 mils apart. In addition to normal back plot procedures, the range can be cross checked by the GFT setting which should compare favorably to known experience factors. The deflection index displacement is another check on the accuracy of the lay.

Observation: "In the event survey control points are not available and tall trees rule out the use of resection, two registrations 1600 mils apart is an acceptable solution for obtaining more accurate battery locations."

SOURCE: Headquarters, 2nd Howitzer Battalion, 17th Artillery

j. 6400 Mil Capability.

Item: "Since there is not clearly a defined FEBA in Vietnam, artillery units usually fire in all directions. This has necessitated the use of a 6400 mil firing chart.

Discussion: "One major change from a standard gunnery technique is the use of the 6400 mil firing chart. All batteries are laid on an azimuth of 6400 mils, deflection 2800 mils. Initial fire commands are prefixed by a warning order stating the gun target azimuth and deflection to the nearest 100 mils. Two sets of aiming posts are placed out 3200 mils apart and auxiliary azimuth markers are placed every 800 mils. In order to reduce aiming post displacement, a marker is placed in the ground under the panoramic telescope after the weapon is laid; upon shifting trails, the sight is repositioned over the marker.

Observation: "Supplementing fire commands with warning orders giving azimuth, use of azimuth markers, and panoramic telescope markers are beneficial when required to maintain a 6400 mil capability."

SOURCE: Headquarters, 2nd Howitzer Battalion, 17th Artillery

k. Registrations.

Item: "Registration of Artillery in more than one direction.

Discussion: "Time will not permit the registration of each

platoon of a battery. It is therefore necessary to register the platoon covering the most critical directions and apply Met Plus VE correction to those platoons that cannot register.

Observation: "Artillery units should be aware of this requirement prior to deployment to Vietnam. Further, they must have valid VE's for their weapons."

SOURCE: Headquarters, 23d Artillery Group

l. Safety.

Item: "Chief of howitzer (gun) section relying on Safety officer.

Discussion: "Due to CONUS safety requirements, chiefs of howitzer (gun) sections have come to rely on the safety officer to check safety; thus, when placed in a combat situation, where he does not have a safety officer leaning over his shoulder, there is a period of adjustment until he learns that he (chief of section) is the safety officer and is entirely responsible for the accurate setting of firing data on the piece.

Observation: "An increased safety responsibility should be placed upon the chief of section during training."

SOURCE: Headquarters, 23d Artillery Group

m. Deflection Indicies for Artillery Platoons (Firing Charts).

Item: "Deflection Indicies for Artillery Platoons.

Discussion: "Firing batteries are usually divided into three platoons for the 105mm and two platoons for heavy artillery (2 guns per platoon in each case). It is important to keep the deflection indicies of each platoon readily visible and discernable on the firing chart.

Observation: "All artillery units should be aware of this requirement prior to deployment to Vietnam."

SOURCE: Headquarters, 23d Artillery Group

n. Adjustment of Illumination and HE

"Frequently, close-in defensive fires must be adjusted under illuminating rounds. The following method of adjusting HE and illuminating rounds greatly reduces the expenditure of HE and illuminating rounds. The observer requests and adjusts the illumination in the normal manner except that he announces "best light" to the FDC when the round best illuminates the target. The FDC uses a stopwatch to time the illumination round's time-of-flight to "best light". The observer requests HE when the desired illumination has been determined. The FDC controls the firing so that the HE rounds land on target at the time previously determined to be "best light"."

SOURCE: Headquarters, 1st Cavalry Division (AM)
(Extracted from a special report.)

o. Use of 105mm Howitzer.

Item: "Use of the 105mm howitzer for additional perimeter defense support.

Discussion: (1) "The use of Charge 1 lowers the muzzle velocity of the 105 howitzer to a point where simple computations can be made rapidly for shooting high explosive projectiles with time fuze. The mechanical time fuze, having a bore-safe feature, has a minimum arming time of 0.7 seconds. Thus, a time setting of less than 0.7 seconds will render the fuze "point detonating only", and must strike the ground or an object to detonate the round. Air burst can be achieved by the use of a standard elevation of 80 mils above the terrain at the perimter and a fuze setting achieved by dividing the range (in hundreds) to the target by 3; for example, a range of 300 meters, a time setting would be 1.0 seconds. This approximation holds true for ranges out to approximately 800 meters.

(2) "Perimeter illumination using high angle fire. Illumination of the perimeter using howitzers in position can be achieved with a simple system of the parachute and produce a streamer. The use of maximum elevation or approximately 1150 mils will insure a trajectory that at 7.0 seconds fuze setting will give a burst at approximately 1000 meters HOB and 400-500 meters in front of the piece. In order to lower the HOB 100 meters, a setting of 5.5 seconds would be required. The average round will burn out just prior to impact with a time setting of 6.0 seconds or a HOB of 800 meters. In order

to increase the range from the gun by 100 meters, the elevation is lowered 50 mils and the time increased 0.5 seconds for ranges over 600 meters This is an approximation to a range of 1000 meters.

Observation: "All 155 artillery units are encouraged to use this data as a starting point in compiling their own refined firing tables for perimeter defensive fires."

SOURCE: Headquarters, I Field Force Vietnam

p. Firing Data For Illumination and HE.

Item: "Use of the 155 Howitzer for additional perimeter defense support.

Discussion: "Use of the high explosive and illumination round fired from the 155mm howitzer, M123A1, on perimeter defense has proved to be reliable and highly effective. Data below was derived from direct and illumination firings conducted by 1st Battalion, 30th Artillery.

PROJ	CHARGE	ELEV	FUZE SETTING	BURST RANGE
HE	1	140	2.7	550M
HE	1	120	2.5	500M
HE	1	100	2.0	425M
HE	1	100	1.9	400M
HE	1	100	1.5	350M
HE	1	80	1.5	275M
HE	1	85	1.3	250M
HE	1	85	1.0	225M

*All bursts indicated were air; mean height of burst 20-25 meters.

PROJ	CHARGE	ELEV	FUZE SETTING	RN	FLARE BURNING TIME
ILL	1	1000	5.0	1200M	Burned out on ground contact
ILL	1	1050	5.0	1000M	Burned out on ground contact
ILL	1	1100	4.5	800M	Burned out on ground contact
ILL	1	1150	2.0	250M	1/3 of flare burned on the ground
ILL	1	800	2.5	450M	1/3 of flare burned on the ground

*Extreme care must be exercised to insure that flare is not wind blown into the battery area.

Observation: "All 155mm artillery units are encouraged to use these data as a starting point in compiling their own refined firing tables for perimeter defensive fires, since current firing tables do not have gunnery data for firing at this minimum range."

SOURCE: Headquarters, I Field Force Vietnam

q. Ammunition.

Item: "Basic Load

Discussion: "The present experience factor shows 60% point detonating fuze, 25% controlled variable time fuze and less than 1% time fuze have been fired. This deviates from training experience in CONUS where 60% point detonating fuze, 10% controlled variable time fuze and 30% time fuze were used in training.

Observation: "That experience factors in combat be utilized in CONUS to make training more realistic and profitable."

SOURCE: Headquarters, 5th Howitzer Battalion, 27th Artillery

r. Fuze for 175MM Gun.

Item: "M51A5 and M572 Fuzes.

Discussion: "The Technical Manual authorized and units were issued and used the M51A5 fuze with the 175mm gun. It was later discovered that only the M572 fuze was authorized to be fired.

Observation: "The Technical Manual should be changed to reflect the correct fuzes for use with the 175mm gun, and logistical support made aware of this requirement."

SOURCE: Headquarters, 23d Artillery Group

s. Battalion Supply Section.

Item: "Splitting the Artillery Battalion Supply Section.

Discussion: "On one occasion, splitting of the battalion supply section resulted in increased efficiency because units of the battalion were separated some thirty-eight kilometers.

Observation: "Units should be made aware of the possibility of being split and to make adjustments to meet their needs."

SOURCE: Headquarters, 23d Artillery Group

t. Convoy Requirements.

Item: "VTR-M88 must accompany displacement of M107 (175mm Gun SP) and M110 (8 inch How SP).

Discussion: "The VTR-M88 must accompany displacement and convoy movements involving the M107's and M110's. This creates a requirement for Class 60 routes, but it is a requirement with which you have to live. The M88 is absolutely essential for towing weapons, that fail to move under their own power, and affording assistance in stream crossing (when feasible) where bridge limitations will not sustain the weight of M107's and M110's. A solution will be the lightweight VTR that is approximately the same weight as the M110's and M107's (30 tons).

Observation: "Units must be thoroughly trained with the VTR-M88."

SOURCE: Headquarters, 23d Artillery Group

u. Communication.

Item: "Compatibility between the old and new series of FM radios.

Discussion: "Experience of the 1st Cavalry Division (AM) during the Plei Me campaign indicated that the compatibility between the old (AN/GRC-3 through 8) and new (AN/VRC-12 and AN/PRC-25) series of FM radios is disappointing. The primary reason for this appears to be the significant difference in operating

bandwidth and frequency instability of the old FM radios, particularly the AN/PRC-9. Positive steps which can be taken to reduce or eliminate this deficiency are as follows:

(1) "Combat units equipped with new FM radios should provide a limited number of these radios to combat support units which are equipped only with the old FM radio series.

(2) "Insure that the old FM radio, AN/PRC-9, is properly netted to the new FM radios prior to commencing an operation and as frequently thereafter as possible."

(3) "Expedite conversion of units to the new family of FM radios.

(4) "As an interim solution until conversion to the new radios is completed, limited quantities of the radio set, AN/PRC-25 may be obtained by combat units equipped with the old FM radios. Units should make this request through normal logistical channels.

Observation: "All personnel should be aware of this deficiency and the actions which may be taken to improve compatibility between the old and new series of FM radios."

SOURCE: Headquarters, I Field Force Vietnam

v. AM Radio.

Item: "Overheating of AN/GRC 46 Components.

Discussion: "Direct exposure to the sun and prolonged operations cause malfunction of the radio set by overheating. A solution is to turn off teletypewriter sets and security equipment when it is not in use. The inside temperature can be reduced by as much as 15 degrees F by building a bunker with overhead cover for the set.

Observation: "Units should be informed of this problem prior to deployment to Vietnam."

SOURCE: Headquarters, 23d Artillery Group

w. Wire Communication.

Item: "Requirements for additional wire, WD-1/TT in artillery units.

Discussion: "Current artillery TOE authorization for wire, WD-1/TT is inadequate to support "double" requirements imposed in Vietnam; i.e., maintenance of base camp areas and simultaneous requirements for landline communication during combat operations away from base camp area. A significant amount of wire is normally permanently installed in the base camp area, thereby reducing the quantity of TOE wire available for use in support of combat operations.

Observation: "Units may obtain replacement for wire, WD-1/TT, which has been permanently installed in base camp areas by following the provisions of USARV Regulation Number 735-4 (Property accountability, signal wire and cable)."

SOURCE: Headquarters, I Field Force Vietnam

4. Engineer Support.

a. Security.

Item: "Security in areas of limited combat activity.

Discussion: "In areas of limited combat activity, a general feeling of complacency is likely to develop.

Observation: "Complacency is one of the factors which adversely affects security the most in areas of limited activity."

SOURCE: Headquarters, 87th Engineer Battalion (Construction)

b. Personnel.

Item: "Lack of personnel.

Discussion: "The Construction Support Company (TOE5-114D) has found that the personnel prescribed by its TOE are not sufficient to run a double shift in both the asphalt plant and the quarry without additional help.

Observation: "Unit should have an increase in TOE strength to enable it to maintain a double shift."

SOURCE: Headquarters, 35th Engineer Group (Construction)

c. Headwalls.

Item: "Field expedient headwalls for culverts.

Discussion: "Because of their quick deterioration in this climate, sandbags make poor headwalls.

Observation: "An acceptable headwall can be built by using river-run rock and mortar. An economical mortar can be mixed using one volume of cement and six volumes of sand. This type construction is very suitable for Vietnamese laborers because of their prior experience in this type of work."

SOURCE: Headquarters, 19th Engineer Battalion (Combat)(Army)

d. Pneumatic Hoses and Universal Couplings.

Item: "Unusual Demand.

Discussion: "In the past three months, broken, split, or worn pneumatic hoses have been the main cause of down time for dozers, graders, and scoop loaders. In this time, this unit has replaced more than 200 feet of hose.

Observation: "Units deploying to this area should prepare for more than normal wear and tear of these items. More universal hose couplings for these pieces of equipment should have also been packed and brought with the unit to RVN."

SOURCE: Headquarters, 168th Engineer Battalion (Construction)

e. Diving Compressors.

Item: "Authorized Compressors Unsatisfactory.

Discussion: "The diving compressors currently authorized the

Port Construction Company were found to be unsatisfactory in CONUS as well as here in Vietnam. An EIR has been submitted but no change has been received. The compressors are very critical items in the operation of a port construction unit. The type of compressor available is used by divers throughout the Army.

Observation: "Adequate safety features have not been provided. This area has been overlooked for quite some time."

SOURCE: Headquarters, 35th Engineer Group (Construction)

f. Dozers.

Item: "Medium Tracked Dozers are too small for jungle clearing and quarry operations.

Discussion: "It has been found that medium tracked dozers are too light to adequately handle jungle clearing and quarry operations. The jungle growth consists mostly of green and flexible type trees. Instead of breaking the trunks or being able to dig out the roots on one pass or even two, the medium dozers ride high and bend the growth only to have it come back up after the pass.

Observation: "Even though medium dozers are faster on light work, heavy dozers of the same make should be standardized throughout the theater."

SOURCE: Headquarters, 46th Engineer Battalion (Construction)

g. Drilling Equipment.

Item: "Inadequacy of TOE rock drilling equipment TOE 5-117D.

Discussion: "Present TOE rock drilling equipment is inadequate to meet production requirements.

Observation: "Rock drilling equipment with increased capability is needed. A 75 ton per hour crawler type pneumatic drill is needed in order to utilize crusher capability. All drilling equipment should be supported with an adequate supply of steel and bits."

SOURCE: Headquarters, 87th Engineer Battalion

h. Drilling Equipment.

Item: "Drilling equipment not sufficient for 75 tons per hour Rock Crusher.

Discussion: "It has been found that TOE drilling equipment is not sufficient for the harder type rock found in RVN. Because of the hardness of rock, the drilling is slow and the drill bits wear faster.

Observation: "Drills, drill steel and bits should be increased by approximately 100%."

SOURCE: Headquarters, 46th Engineer Battalion (Construction)

i. Commercial Type Vehicles.

Item: "Civilian contractors and the U. S. Air Force use commercial type vehicles in this theater of operations.

Discussion: "Commercial type vehicles require roads of a higher standard than military vehicles.

Observation: "The use of commercial type vehicles by contractors and the U.S. Air Force in a theater of operations requires higher standards of roads and more construction effort than would otherwise by required in initial phases of development."

SOURCE: Headquarters, 87th Engineer Battalion (Construction)

j. Rock Crusher.

Item: "Dust cover on primary scalper shaft and secondary main shaft.

Discussion: "Setscrew on dust covers should be countersunk into the shaft by drilling an indentation.

Observation: "Set screws on dust covers of primary scalper shaft and secondary main shaft of the 75 TPH Eagle Rock Crusher tend to slide and allow the dust cover to slide down the shaft."

SOURCE: Headquarters, 299th Engineer Battalion (Combat)

l. Water Distribution.

Item: "Water Distribution for Construction Project.

Discussion: "Due to the extreme heat, and in most cases the length of the water haul route, water for compaction and other construction projects is very critical throughout the Republic of Vietnam. The six water distributors (1,200 gals each), authorized a Construction Battalion, are not sufficient for any large earth work project, and must be augmented with another means of transporting water. Methods utilized included:

(1) "The erection of a Truck Fill Stand as close to the construction site as possible, thereby minimizing the length of the water haul. This can be done by installing either 4" or 6" invasion pipe from water source to the Truck Fill Stand. One standard pump is required.

(2) "The use of Navy Cubes, T6B Pontoons, tied together on a 25 ton trailer. The water discharge is by gravity through a prefabricated spray bar. This method enables a total of 4,500 gallons of water to be handled at one (1) time. Any similiar large water container tank may be so hooked up.

(3) "On construction sites where concrete is being placed, fabric water tanks, either canvas or rubberized, are used to store large quantities of water for mixing and curing purposes.

Observation: "All Construction Units that will be engaged in large earth work projects should be augmented with either additional water distributors or tanks suitable for water haul. Augmentation would be dependent upon length of water haul and scope of project."

SOURCE: Headquarters, 18th Engineer Brigade

m. Well Drilling Detachment.

Item: "Well Drilling Detachment.

Discussion: "Well drilling detachments have arrived in country but materials which would make their work effective has not yet arrived.

Observation: "Every well drilling detachment should deploy from CONUS with enough well casing, pumps, screws, etc. to employ minimum of 5 wells pending delivery of materials through normal channels."

SOURCE: Headquarters, 18th Engineer Brigade

n. Expedient Water Distribution Vehicles.

Item: "Navy Cubes utilized as Water Distributors.

Discussion: "Navy cubes may be used in conjunction with many types of vehicles to serve as satisfactory water distributors either singly or in various combinations, depending only on size and capacity of the vehicle they are mounted on. The use of the vehicle is not impaired for other purposes as the empty cubes may be lifted off by a crane with a minimum effort and without removal of expedient spray bars.

Observation: "The use of Navy Cubes as interm water distributors greatly enhances the capability of construction units."

SOURCE: Headquarters, 35th Engineer Group (Construction)

o. TOE Pontoons and Cranes.

Item: "Pontoons and a minimum of two cranes are necessary for effective Port Construction operations.

Discussion: "Over the water operations have proven the need for all the pontoons organic to the Port Construction Company and simultaneous use of at least two cranes almost continuously. Both items are very critical in port construction operations and greatly affect the ability to work over water when unavailable.

Observation: "Pontoons are needed as over-water working platforms and for hauling materials, cranes to place material and drive piling."

SOURCE: Headquarters, 35th Engineer Group (Construction)

Section III

A SUMMARY OF LESSONS LEARNED

IN

"COMBAT SERVICE SUPPORT OPERATIONS"

1. Medical Service.

a. Minor Cuts and Wounds.

Item: "Minor cuts and wounds are more susceptible to infection in RVN.

Discussion: "Minor wounds tend to heal more slowly in Vietnam than in CONUS. Conditions in the country tend to promote infection of wounds which puncture the skin.

Observation: "It is advisable that even apparently minor cuts, bruises, or punctures of the skin receive prompt medical attention, to include disinfectant and tetanus boosters where necessary, to preclude infection."

SOURCE: Headquarters, 54th Signal Battalion (Corps)

b. Security Clearances.

Item: "Security clearances of doctors, dentists and nurses.

Discussion: "Many professional officers are arriving in-country without clearances or without a DA Form 873 (Certificate of Clearance) in their 201 file. This creates a large administrative workload for the supporting unit and causes a delay in granting final or interim clearances for personnel with a need to know.

Observation: "As soon as an individual or a unit is alerted for overseas shipment, the 201 files should be screened for completeness to include a DA Form 873 or to indicate that a NAC has been initiated."

SOURCE: Headquarters, 58th Medical Battalion

c. Crypto Equipment.

Item: "Medical units arriving in-country with crypto equipment.

Discussion: "All medical units preparing for overseas movement to Vietnam receive instructions to deploy with all authorized crypto equipment. Some units are being issued this equipment only days before departing CONUS. Immediately upon unit arrival in Vietnam, all crypto equipment is turned into the USARV Signal Crypto Custodian. Presently, no medical units in-country are using crypto equipment. The Logistical Support Areas are providing all necessary communication facilities.

Observation: "If the medical units were allowed to deploy from CONUS without this equipment, it would alleviate a large security and administrative burden."

SOURCE: Headquarters, 58th Medical Battalion

d. Litter Supports/Medical.

Item: "Litter Support.

Discussion: "Litter supports in the form of elongated saw horses have proved effective in processing large numbers of casualties. The supports were made of scrap lumber and built in a matter of minutes. The length was twelve feet and the height 2.5 feet. Two stands used together allowed the placement of multiple litter patients. The stands are portable and can be moved as needed. They were effective during triage and in pre-operative wards.

Observation: "Improvised litter supports can be used when processing large numbers of litter patients."

SOURCE: Headquarters, 85th Evacuation Hospital (SMBL)

e. Battalion Aid Station.

Item: "TOE Allowances for Battalion Aid Station.

Discussion: "All aid stations have a continuing requirement to keep immunizations current and to store perishable medical items such as antibiotics. These units should have the capability to store these items. In Vietnam, aid stations are relatively stationary; therefore, they should have a refrigeration capability. There is a need for other medical equipment such as autoclaves, suction machines, breathing bags and "cut down" trays to allow the aid station to fully meet its requirements for providing emergency care. This is a requirement for all Engineer Aid Stations in the Brigade.

Observation: "TOE for Engineer Battalion Aid Stations should be reviewed and modified."

SOURCE: Headquarters, 18th Engineer Brigade

f. Requirement for Intracaths.

Item: "Intracaths have been used in Vietnam with a high degree of success.

Discussion: "In combat situations, necessity for first aid and resusative care require the rapid administration of blood and I.V. fluids without having to resort to time-consuming methods of venous cutdown. Use of plastic intracaths or venocaths offers the physician and/or aidman a quick action method of administration of fluids.

Observation: "Intracaths and venocaths should become standard items available for mass issue to medical facilities throughout existing and programmed medical channels in Vietnam."

SOURCE: Headquarters, 1st Infantry Division

g. Spectacle Frames.

Item: "Effect of tropical heat on cellulose acetate spectacle frames.

Discussion: "Frames which have been abnormally contracted to accommodate an undersized lense will usually expand when exposed to the intense tropical sun for prolonged periods of time.

Observation: "Lenses should be 'on size' or slightly 'over size' in order to prevent their being dislodged from the eye wire during normal use in a hot, humid climate."

SOURCE: Headquarters, 32nd Medical Depot

h. Chloroquine and Quinine.

Item: "Incidence of Chloroquine and Quinine resistance in Plasmodium Falciparum Malaria.

Discussion: (1) "Of the patients treated with chloroquine alone, 94% were resistant and relapsed in an average of eight days.

(2) "Of the patients treated with quinine alone, 69% were resistant and relapsed in an average of fourteen days.

(3) "Of the patients treated with a combination of these two drugs, 62% were resistant and relapsed in an average of thirteen days.

Observation: "At the present time, repeated courses of quinine appears to be effective in controlling each attack. However, relapses have been seen as soon as two days following a course of thirty gms of quinine given over a ten day period. At least in several cases, the patients' responses appeared to be dose related; i.e., the patients became afebrile and asymptomatic on three gms of quinine daily and relapsed when the dose was dropped to two gms daily."

SOURCE: Headquarters, 9th Field Hospital

i. Tobruck Splint.

Item: "Modified Tobruck splint.

Discussion: "A modified Tobruck splint has been used in the transportation of fracture of the femoral shaft and supracondylar area. Patients tolerate transportation well and the method has the advantage of maintaining skelectal traction during transit.

Observation: "The modified Tobruck splint should be considered the method of choice for transporting fractures of the femoral shaft, distal half.

SOURCE: Headquarters, 85th Evacuation Hospital (SMBL)

j. Antibiotic Resistance.

Item: "Antibiotic resistance in Shigella infections.

Discussion: (1) "Resistance to tetracycline was found in 39 of 60 cases of Shigella Flexneri; in 14 of 32 cases of Shigella Sonnei; and 1 of 3 cases of Shigella Dysenterine.

(2) "Resistance to chloromycetin was found in 5 of 60 cases of **S. Flexneri**, in 4 of 32 cases of **S. Sonnei** and in 1 of 3 cases of S. **Dysenterine.**

(3) "Resistance to neomycin was found to exist in 2 of 60 cases **of S. Flexneri** and none in the cases of S. **Sonnei** and **S. Dysenterine.**

Observation: "In future treatment regimes for Shigellosis, use of an antibiotic combination such as neomycin and polynycin should be considered."

SOURCE: Headquarters, 9th Field Hospital

k. Tuberculosis.

Item: "Incidence of tuberculosis in indigenous personnel.

Discussion: "An X-ray study revealed that 13% of 361 Nung guards had active tuberculosis. Patients found to have active tuberculosis were treated on an outpatient basis with triple therapy and response was highly gratifying.

Observation: "It is strongly recommended that other units employing indigenous personnel institute a similar program, thereby reducing hazard of exposure to our troops."

SOURCE: Headquarters, 9th Field Hospital

l. Leptospirosis.

Item: "Leptospirosis.

Discussion: "A total of 9 cases of **Leptospirosis** was diagnosed and treated with one fatality due to **Fulminate Hemorriagic Pneumonia.**

Observation: "Although **Leptospirosis** is usually a mild "flu" like syndrome, it can be fatal and every effort should be made to prevent rats from contaminating food. Suspected cases of **Leptospirosis** should be hospitalized immediately and given appropriate therapy."

SOURCE: Headquarters, 9th Field Hospital

m. Scrub Typhus.

Item: "Scrub Typhus.

Discussion: "A total of 29 cases of Scrub Typhus were seen during this period. Of these, 5 patients relapsed and 3 required longer than 60 hours to respond to treatment.

Observation: "In our experience, the best treatment regimes were:

(1) "Chloromycetin in the amount of 1 gm every hour for 3 doses followed by 1 gm every 8 hours until a total dosage of 16 gms has been administered.

(2) "Chloromycetin in the amount of 1 gm every hour for 3 doses followed by 1 gm every 8 hours for a total dosage of 12 gms. This, in turn, followed by a prophylactic dose of 3 to 4 gms given 3 to 4 days after completion of the initial treatment.

"Contrary to the commonly accepted average relapse figure of 8 days following discontinuance of treatment, our relapses occurred on an average of 4 days (range: 2 to 5 days)."

SOURCE: Headquarters, 9th Field Hospital

n. Malaria.

Item: "Recognition and treatment of complications of Falciparum Malaria.

Discussion: "The two most frequent serious complications of Falciparum Malaria are (1) Acute Renal Failure with or without Blackwater Fever and (2) Acute Brain Syndrome. The former may be occult (without dark urine). The latter may be present in a variety of ways, but is often heralded by severe headache, somnulence, disorientation and extreme lethargy with or without localizing signs. The two most useful prognostic signs are (1) duration of illness before recognition and treatment (i.e., the longer the period of symptoms, the greater the possibility of complications) and (2) the degree of Paranitemia. It is suggested that careful recording of intake and output be accomplished at least for the first two days of hospitalization. Severely ill patients have a propensity to retain water in excess of body needs in the presence of increased thirst. The search of presence of other disease complicating malaria is also imperative in the severely ill patient. Rapid recognition and treatment of early complications improves prognosis considerably. Prompt evacuation of patients with a rising BUN to a facility

where dialysis is available is requisite to a successful outcome. Intravenous quinine is the drug of choice for severely ill patients, even in the presence of Blackwater fever.

Observation: "Careful attention to these observations and experience will significantly improve prognosis."

SOURCE: Headquarters, 85th Evacuation Hospital (SMBL)

o. Prostatitis.

Item: "Recognition of prostatitis in dispensary, field and clearing units.

Discussion: "Many cases of prostatitis have been referred to field and evacuation hospital with diagnosis of Pyelonephritis, refractory "UTI", low back pain and persistent uretheral discharge. It is strongly suggested that men who complain of low back pain, urethral discharge or have abnormal sediment finding on urinalysis be carefully examined rectally for the presence of prostatitis. Good results have been achieved by the use of therapeutic doses of tetracycline and frequent prostate massage for a period of 10 to 14 days. Lack of response or complications make urological consultation adviseable.

Observation: "Man hours will be saved by proper diagnosis, precluding unnecessary transfers to hospital."

SOURCE: Headquarters, 85th Evacuation Hospital (SMBL)

p. Hookworm.

Item: Recognition of hookworm infestation.

Discussion: Hookworm infestation in military personnel is not uncommon in Vietnam. The use of protective footwear is imperative but infection through the skin can occur even in the presence of reasonable prophylactic measures. The symptom complex of epigastric pain (like typical peptic ulcer distress), diarrhea (but may be absent) and eosinophilia strongly suggest the diagnosis of hookworm infestation. It is suggested that all patients with continuing abdominal pain or typical ulcer symptoms be examined for hookworm ova. Often these are difficult to find especially early in the disease. We feel that a course of therapy (tetrachloethylene or hexylresorcinol) be given even without demonstration of the parasite if epigastric pain or diarrhea and eosinophilia are present. This should be done

only after a careful search for other causes has been undertaken. Tetrachlorethylene should not be used until after ascariasis has been separately treated."

SOURCE: Headquarters, 85th Evacuation Hospital (SMBL)

q. Streptomycin.

Item: "Use of streptomycin.

Discussion: "It is strongly suggested that streptomycin not be used to treat pulmonary or genitourinary infections unless a careful search to exclude tuberculosis has been carried out. We have had a number of patients with pulmonary infiltrates or hematuria so treated where the diagnosis of tuberculosis might have been suspected. Such treatment greatly prolongs the period of observation to exclude tuberculosis as a possible diagnosis.

Observation: "Streptomycin should not be used unless tuberculosis is ruled out."

SOURCE: Headquarters, 85th Evacuation Hospital (SMBL)

r. Treatment of Scrub Typhus.

Item: "Recognition and treatment of scrub typhus.

Discussion: "Infection by rickettsia tsutsugamushi is a common disease in Vietnam. Typically, the patient will have unexplained fever, headache and other systemic symptoms with repeatedly negative malaria smears. A careful search over the entire skin surface for ulcerations, bites and especially an eschar is necessary and highly profitable. Treatment with tetracycline for five to seven days is suggested. Although shorter periods of therapy may be employed, we have found the slightly longer duration of therapy advisable to prevent relapses. On such treatment the patient should be afebrile in from 12 to 40 hours or another diagnosis must be entertained.

Observation: "Rickettsial infections can be detected and treated."

SOURCE: Headquarters, 85th Evacuation Hospital (SMBL)

s. Construction and Mass Casualties.

Item: "Construction for medical facilities.

Discussion: "When a medical facility is approved for construction, consideration to processing of patients in a mass casualty situation must be made. Buildings with large open areas are required. Buildings should be as free of interior partitioning as possible. This is specially true in receiving area, x-ray, pre-op ward, surgery and post-op ward. Other wards must be capable for conversion to either pre-op or post-op use. Since all patients are handled on hand carried litters, the receiving area should have double doors for entry and exit, and a flow of patient traffic, without backtract, from receiving to x-ray to pre-op to surgery is most important. Surgery should be designed with stalls rather than rooms for ease in handling large numbers of litter borne patients.

Observation: "Proper design and layout of hospital plants facilitates processing of mass casualties."

SOURCE: Headquarters, 85th Evacuation Hospital (SMBL)

t. Anesthesia Apparatus.

Item: "Anesthesia in high temperature environment.

Discussion: "Anesthesia apparatus, as supplied in TOE equipment was implicated in operative difficulties during the early phase of activity in this unit. We feel that when anesthesia machines are used in hot climates, the anesthesioligist should be provided with machines bearing large re-absorbtion canisters. Such machines are available from standard and non-standard sources.

Observation: "Anesthesia apparatus with large re-absorbtion canisters. are necessary in high temperature environments."

SOURCE: Headquarters, 85th Evacuation Hospital (SMBL)

u. Operating Room Facilities.

Item: "Operating room facilities with tent shelters and in quonset huts.

Discussion: "During the period when the hospital was required to use tents, improvement in surgical facilities occurred due to use of box shaped plywood structures. Thermal insulation materials were used and airconditioning was successfully applied. The "boxes were within tents. When the location of the hospital was changed, the "boxes" were moved on trucks and used until better facilities could be obtained. Surgical operations are now performed in a double quonset hut. There are five surgical tables, and there are areas for instrument storage, for changing of clothes by personnel and for OR administration. There are partitions, but not rooms per se. The system of stallas as opposed to a system of rooms was debated.

Observation: We are pleased that we selected the stall system. It enables expeditious entrance and exit of litter borne patients and allows nearly even distribution of ventilation from the ductless window air-conditioners."

SOURCE: Headquarters, 85th Evacuation Hospital (SMBL)

v. Special Purpose Equipment for Vietnam.

Item: "Operating conditions in RVN have required procurement of equipment additional to TOE authorization.

Discussion: "Climatic conditions and the requirements for operating from fixed locations have required numerous equipment additions to TOE hospitals now in Vietnam. For example, an evacuation hospital requires two 100 kw generators; one 600-cubic foot walk-in refrigerator; additional household-size refrigerators; ice-making machines; airconditioning for surgical suites, recovery wards and intensive care wards, and approximately 3,000 feet of 00-size wiring for electrical distribution system. It is taking from sixty to eighty days to obtain these items after submission of requisitions.

Observation: "Date on which hospitals become operational could probably be advanced if units were given authority to deploy with the required generators and other special equipment."

SOURCE: Headquarters, 43d Medical Group

w. Climatic TOE Items.

Item: Tent Liners, Tent Stoves and Space Heaters.

Discussion: A medical unit deploying to Vietnam should not be required to bring with it all TOE items merely because they are on the unit TOE. Cold weather items such as tent stoves and tent heaters should be left in CONUS. However, some items of equipment are as useful in Vietnam as they are in a cold climate - the tent liner is a good example. Tent liners provide insulation against heat as well as cold. When medical units are required to use tents a tent liner will make the tent a more comfortable environment for patients and medical personnel.

Observation: TOE items should be examined with care to determine their mission usefulness in Vietnam. When not needed they should not be brought to Vietnam. All deploying medical units bringing tents should be sure to bring the liners for their tents.

SOURCE: Headquarters, 32d Medical Depot

x. Evacuation of Wounded.

Item: "Evacuation of wounded.

Discussion: "When contact is made with an enemy force in dense jungle terrain where no open landing zones are available, the Air Force H-43 Helicopter with its 200 foot lowering cable can be used effectively, but slowly, to evacuate personnel.

Observation: "A cable hoist system is urgently needed for the Army UH-1 helicopter."

SOURCE: Headquarters, 173d Airborne Brigade (Separate)

y. Forward Medical Clearing Station

Item: "Forward Medical Clearing Station.

Discussion: "The technique of establishing a Forward Medical Clearing Station at the Brigade Forward Support Base during combat operations proved very successful. Many lives were saved by the immediate medical care available at the station. In addition, personnel with minor wounds, illnesses or even dental problems could be treated and returned to duty immediately.

Observation: "Continued use of the Forward Clearing Station will save many lives and prevent evacuation of personnel with minor injuries or illnesses who can be treated and returned to duty."

SOURCE: Headquarters, 173d Airborne Brigade (Separate)

z. Medical Evacuation.

"The reaction time for medical evacuation missions was sometimes increased during the initial stages of airmobile assaults due to lack of familiarity by medical evacuation pilots with PZ's and LZ's being used by specific units. Frequently, Med Evac ships have had to search unfamiliar terrain for the exact LZ's, thus losing valuable time. Medical evacuation helicopters should follow major troop lift formations during the initial assaults to determine the LZ's being used and to become terrain oriented. Further, the presence of Med Evac ships in the initial assault echelon greatly speeds evacuation at the critical time."

SOURCE: Headquarters, 1st Cavalry Division (AM)
(Extracted from a special report.)

aa. Casualty Reporting.

"Although our casualty reporting system is good, difficulties were met when the division operated at extended distance and when the land lines of communication were overburdened. This problem was overcome by the use of air couriers and by placing personnel from the AG Casualty Reporting Section forward with the brigades. This problem has been more fully resolved by establishing a secure RATT station at Division Rear operating on the D-7 Admin/Logistics net. The forward casualty reporting teams, located at the FSE, have ready access to this secure teletypewriter system."

SOURCE: Headquarters, 1st Cavalry Division (AM)
(Extracted from a special report.)

bb. Fabrication of Helipad Lights.

Item: "Helipad lights are required for air ambulances.

Discussion: "With the increased use of air ambulance, helipad lighting systems are necessary for all medical treatment facilities in combat areas.

Observation: "All medical companies should acquire or fabricate landing lights for helipads prior to deployment to combat areas. These systems should be available for immediate operation to guide incoming air ambulances to casualty evacuation points. Lighting systems can be as simple as a can full of sand and gas or issued battery powered light sets."

SOURCE: Headquarters, 1st Infantry Division

cc. Evacuation Bags.

Item: "Evacuation Bags.

Discussion: A medical evacuation bag was designed to provide warmth and to protect a casualty from cold weather during evacuation. These bags are provided by TOE to most medical sections and medical units. In Southern Vietnam, temperatures are such that evacuation bags are not required for patient transportation. The bags are troublesome and awkward to store and transport

Observation: "Evacuation bags are not practical in Vietnam."

SOURCE: Headquarters, 23th Artillery Group

dd. Old and New Casualties.

Item: "Intermingling of New and Old casualties in surgical wards.

Discussion: "Observations were made, in November and December 1965, that newly arrived IRMA casualties were being received and sorted on the same ward where post-operative patients were being attended. This resulted in an adverse effect on the new casualties when they were able to observe prior to their surgical treatments some of the more seriously injured individuals on the wards. It was also readily appreciated that the mixing of the new casualties with those previously received tended to make convalescing patients relive their own moments of anxiety and resulted in a generalized lowering of morale.

Observation: "A separate ward for the receipt, triage and pre-operative resuscitation of newly arrived casualties has been put into operation. Post-operative patients are not taken back to the ward where many of their friends may still be waiting for definite surgical treatment. This plan has resulted in a more satisfactory handling of the casualties and the beneficial results of this change have been readily appreciated by all concerned."

SOURCE: Headquarters, 523d Field Hospital

ee. Anesthesiologist.

Item: "Anesthesiologist.

Discussion: "Casualties are most frequently received in sporadic inputs and above average amounts, requiring periods of "round the clock" surgery with surgical teams working in shifts for extended periods. For this purpose, surgeons, surgical nurses and technicians are sufficient to formulate such teams and prevent complete exhaustion of any given group. A single anesthesiologist compromises this concept.

Observation: "Assignment of one (1) additional anesthesiologist to each operating hospital unit of a Field Hospital would alleviate this potentially limiting factor to the capabilities of the other personnel to perform at high standards for extended periods of time under emergency conditions. Exhaustion can be a critical factor in the ability of a surgical team to perform cohesively and render maximum lifesaving capabilities."

SOURCE: Headquarters, 9th Field Hospital

ff. Drug Storage.

Item: "Storage of drugs requiring critical temperature range.

Discussion: "Numerous drugs (penicillin, ointments, hyrocostone liquids, sulfa liquids) have storage restriction, e.g., 'store in a cool dry place' or 'store between 50 and 60 degrees F'. Lack of potency was noted in these drugs when it was not feasible to follow the restrictions in Vietnam. Reduction of temperature and humidity by use of a small air conditioner in the drug storage area protects these drugs from spoilage.

Observation: "Air conditioning is required to protect temperature critical drugs."

SOURCE: Headquarters, 23th Artillery Group

gg. Quantity of Medical Supplies.

Item: "The quantity of medical expendable supplies for units deploying to Vietnam should be increased.

Discussion: "Medical expendable supplies for deploying units was limited to 15 days. This amount was found to be inadequate due to resupply delays

initially experienced upon arrival in country.

Observation: "Medical expendable supplies accompanying units deploying to Vietnam should be increased to 30 days to overcome initial delay in resupply efforts."

SOURCE: Headquarters, 1st Infantry Division

hh. Non-Standard References.

Item: "Nonavailability of nonstandard references.

Discussion: "Nonstandard catalog and reference material were not available to this unit which made it difficult to identify items requested by customers. The customers are ordering drugs by trade name. Also, medical and surgical instruments cannot be identified upon receipt from the manufacturer.

Observation: "Medical units leaving the ZI should have nonstandard catalog and PDR in their assembly."

SOURCE: Headquarters, 32d Medical Depot

ii. Storage of Vaccines.

Item: "Biologicals exceed required refrigeration facilities.

Discussion: "The quantity of vaccines required for normal immunization of divisional troops exceeds the refrigeration capabilities of division medical supply.

Observation: "Stock only sufficient quantities for routine and emergency innoculations. When quantities for mass immunizations are required, arrange for airlift prior to withdrawal of biologicals from medical depot."

SOURCE: Headquarters, 1st Infantry Division

jj. X-Ray Film.

Item: "X-ray film deterioration.

Discussion: "X-ray film being subject to deterioration at high temperature, thus the depot has had to keep stocks stored under refrigeration. When the amount of stocks on hand exceeds the refrigerated storage capacity, stocks have to be rotated.

Observation: "In the absence of large refrigeration capabilities, film being shipped to areas of high heat should be packaged utilizing a reflective foil material that will cut down on heat absorption. Further, shipping labels should stress the necessity to store film in the coolest space available."

SOURCE: Headquarters, 32d Medical Depot

kk. Cardboard Containers.

Item: "Cardboard containers used for packing of supplies, and labels used on bottled drugs and medicines, deteriorate and become illegible or fall off after periods of open storage in a rainy climate.

Discussion: "The absence of covered storage permits the rain to saturate cardboard containers which, after a period of soaking, lose their tensile strength and break open. Medical items identified by gummed labels attached to containers or bottles eventually become illegible and or fall off, causing loss of identity of the item and prohibiting its use.

Observation: "Covered storage is an essential requirement for storage of medical supplies and items in cardboard containers."

SOURCE: Headquarters, 1st Logistical Command

2. Logistics.

a. Construction.

(1) Electrical Power Equipment.

Item: "Electrical generator equipment.

Discussion: "Because of the demands for construction effort in Vietnam, the Engineer Construction Battalions are operating on a 24 hour, 7 day a week basis. Construction during hours of darkness requires the use of all

available lighting equipment and generators. In addition to construction lighting, there is a definite need for security and cantonment lighting, and when local commercial power is not available, TOE generator equipment is required. The continuous usage of generators for construction, security, and cantonment lighting, is straining the equipment to the utmost and forcing its use well past the life expectancy of the equipment. If larger generators (60-100KW) were provided to Engineer Construction Battalions for security and cantonment lighting, the smaller TOE portable generators would be free for construction lighting, thus giving better illumination to the construction sites.

Observation: "Construction Battalions should be provided with 2 each 100KW generators for purpose of providing security and cantonment lighting and as a general source of power for such items as ozalid machines, refrigeration (mess use) and billet lighting."

SOURCE: Headquarters, 62d Engineer Battalion (Construction)

(2) Maintenance and Equipment Consolidation.

Item: "Consolidation of all heavy equipment operators and engineer mechanics into the headquarters company.

Discussion: "This unit has consolidated all heavy equipment operators and engineer mechanics into the equipment platoon in order to provide centralized control of equipment and maintenance support for the battalion. Because of priorities assigned to various projects, a majority of the battalion's equipment is often required to work on one project. Centralization has eliminated the problem of coordinating the use of one company's equipment and operators on another company's project and provides a pool from which equipment may be allocated for support of all construction projects.

"The repair of equipment has also benefited by this arrangement in that the mechanics are pooled in a quantity large enough to establish a twenty-four hour repair schedule. Equipment is repaired and returned to the project more quickly, thus increasing the battalion's capability.

Observation: "This consolidation of equipment and mechanics has increased the construction capability of the battalion by providing flexible support under centralized control."

SOURCE: Headquarters, 19th Engineer Battalion (Combat)

(3) Material Handling Equipment.

Item: "Material handling equipment for off-loading supplies.

Discussion: "Due to the lack of sufficient supply storage yards and personnel to handle supplies, the engineer units have had to handle all classes of supplies coming to them. Normally, an engineer construction unit would not be required to off-load the supplies from the ships, rail or aircraft, and haul the tonnage of supply required to support the unit, plus support the construction material handling. The TOE authorization for the engineer construction battalion does not authorize any material handling equipment; therefore, construction personnel and equipment have been utilized to off-load these items. This material handling takes away from the construction effort. The movement of parts and supplies on construction sites could be handled more efficiently if material handling equipment was available.

Observation: "Engineer Construction Battalions should be augmented with material handling equipment for use in the handling of supplies and construction materials both in the supply yards and construction sites. Augmentation would depend upon existing support provided by the logistic units in the area and scope of materials required for the construction effort."

SOURCE: Headquarters, 18th Engineer Brigade
Headquarters, 62d Engineer Battalion (Construction)

(4) Vietnamese Labor.

Item: "Vietnamese labor for construction projects.

Discussion: "Vietnamese laborers are very satisfactory when assigned to the same task for the duration of the project or when skilled labor is hired. The problem involved in hiring Vietnamese laborers can be minimized if an interpreter is available to exercise control over personnel hired. A work card or pass should be issued to insure that the same laborers are worked for the duration of the project. Vietnamese are very adept at reproducing work cards, so care must be taken in the selection of work cards and they must be changed periodically.

Observation: "Personnel who plan to utilize Vietnamese labor should be aware that work cards are needed of a type which cannot be easily reproduced by the laborers, and that the service of an interpreter is also needed."

SOURCE: Headquarters, 19th Engineer Battalion (Combat)

(5) Radio Control of Job Sites.

Item: "Radio communication increases the effectiveness of units with widespread job sites.

Discussion: "Prior to receiving assigned frequencies from higher headquarters, it was very difficult to control widely separated projects. In the event of equipment breakdown, a vehicle had to be dispatched from the job site to the battalion area for maintenance support, and instructions from battalion headquarters could not be obtained without returning to the battalion area.

"After receiving radio frequencies and establishing a remote station in the S-3 Section, control was established over the projects without loss of time. Questions can be answered and maintenance support obtained without someone physically leaving the project site.

Observation: "The FM radios organic to the combat engineer battalion provide an effective means of flexible control over widely separated construction sites."

SOURCE: Headquarters, 19th Engineer Battalion (Combat)

(6) Sewage Disposal.

Item: "Existing Septic Tank method of sewage disposal is unsatisfactory.

Discussion: "Sewage disposal is the prevalent problem facing engineers. Because of a high water table and flood condition during the monsoon season, the septic tank method of sewage disposal is unsatisfactory. The only feasible solution to this situation is the construction of sewage treatment facilities which pass unharmful effluent into rivers or the sea.

Observation: "All agencies connected with planning, design, and constuction in Vietnam should be made aware of this situation."

SOURCE: Headquarters, US Army Support Command, Nha Trang

(7) Preparation of Ground.

Item: "Preparation of ground for 1800 cubic feet reefer.

Discussion: "Reefers were mounted on laterite packed ground, with 4" by 4" skringers, which was not sufficent to keep the box from settling. Cracks appeared almost immediately between sections of the box causing loss of refrigeration efficiency and eventual breakdown of the refrigeration unit."

Observation: "The only base adequate for this purpose is concrete."

SOURCE: Headquarters, 60th Ordnance Group (M&S)

(8) Preparation of Ground.

Item: "Preparation of ground for pallet storage of all classes of supply."

Discussion: "The earth in this area of operation is not of sufficient density to stand up under the weight of heavy loads of supplies or vehicles in depot operations."

Observation: "Approximately six inches of laterite packed into a leveled surface is sufficient base for this type operation."

SOURCE: Headquarters, 60th Ordnance Group (M&S)

(9) Jungle Operation.

Item: "Medium tracked dozers are too small for jungle clearing and quarry operations."

Discussion: "It has been found that medium tracked dozers (TD-20 and D-7) are too light to adequately handle jungle clearing and quarry operations. The jungle growth consists mostly of green and flexible type trees. Instead of breaking the trunks or being able to dig out the roots on one pass or even two, the medium dozers ride high and bend the growth only to have it come back up after the pass."

Observation: "Even though medium dozers are faster on light work, heavy dozers of the same make should be standardized throughout the Theater."

SOURCE: Headquarters, 18th Engineer Brigade

(10) Water Distribution

Item: "Water distribution for construction projects.

Discussion: "Due to the extreme heat and in most cases the length of the water haul route, water for compaction and other construction projects is very critical throughout the construction of the Phan Rang, Republic of Vietnam Airfield. The six water distributors (1200 gal each) authorized a Construction Battalion are not sufficient for any large earth work project, and must be augmented with another means of transporting construction water. Methods utilized by this battalion included:

(a) "The erection of a truck fill-stand as close to the construction site as possible, thereby minimizing the length of the water haul. This can be done by installing either 4" or 6" invasion pipe from water source to the truck fill-stand. One standard pump is required.

(b) "The use of three Navy cubes, FCB Pontoons, tied together on a 25 ton trailer. The water discharge is by gravity through a prefabricated spray bar. This method enables a total of 4500 gallons of water to be hauled at one time. Any similar large water container tank may be so hooked up.

(c) "On construction sites where concrete is being placed, fabric water tanks, either canvas or rubberized, are used to store large quantities of water for mixing and curing purposes.

Observation: "All construction units that will be engaged in large earth work projects should be augmented with either additional water distributors or tanks suitable for water haul. Augmentation would be dependent upon length of water haul and scope of project."

SOURCE: Headquarters, 62d Engineer Battalion (Construction)

(11) Cutting Hardwood Timber.

Item: "The hardwoods in Vietnam are ruining our saws.

Discussion: "Most of the issued saws are designated for cutting stateside timber which is considerably less dense than the hardwoods, such as mahogany, found in Vietnam. The Vietnam hardwoods will ruin the blade on power saw within a week of continuous operation. Engineer units should refrain from cutting the hardwood timber until they are able to obtain some hardwood saw blades.

Observation: "All units having wood saws should be informed of this lesson or they will ruin their saws before discovering the problem."

SOURCE: Headquarters, 70th Engineer Battalion (Combat)

(12) Port Operations.

Item: "Salt-water operations effect on floating equipment.

Discussion: "Salt-water operation differs from fresh-water operation in that barnacles are a big problem. Barnacle growth is extremely fast on aluminum power boats and relatively fast on M4T6 pneumatic floats. The barnacles are damaging to both M4T6 floats and metal components.

Observation: (a) "Portions of the power boats that are below the water line were painted with red lead to reduce barnacle growth.

(b) "As to date, no solution has been found to minimize barnacles on M4T6 pneumatic floats. Engineer Research and Development is investigating this problem."

SOURCE: Headquarters, 18th Engineer Brigade

(13) Pile Driving.

Item: "Pile driving.

Discussion: "Piles driven in soft, wet clay such as found in and around rice paddies will penetrate very rapidly and to excessive lengths.

Observation: "If piles are allowed to rest 24 hours, they will freeze up and design friction can be attained with much shorter pile lengths. In some cases wood piles froze to the extent that they were at refusal the next day in spite of the fact they had penetrated most of their length with the only driving force being the dead weight of the hammer. This applies to steel piles as well as wood."

SOURCE: Headquarters, 299th Engineer Battalion (Combat)

(14) Bridges.

Item: "Strength of concrete bridges in Vietnam.

Discussion: "Most concrete T-beam bridges encountered in Vietnam have been constructed with extraordinary size re-rod, resulting in much higher strength than is apparent from calculations based on dimensions of the concrete.

Observation: "It has been found that existing concrete piers may be used in new construction by extending their width by driving pile piers adjacent to existing structure. This method has been used on 3 Class 35 bridges to date."

SOURCE: Headquarters, 299th Engineer Battalion (Combat)

(15) Power Boat Operators.

Item: "Power boat operators.

Discussion: "Power boat operators did not have sufficient training prior to rafting operations at My Ca, Vietnam.

Observation: (a) "The Corps of Engineers establish a 27' powerboat operators school to train powerboat operators in the capabilities, maintenance of, and operation of the 27' Bridge Erection boat.

(b) "Utilize all opportunites to give powerboat operators experience."

SOURCE: Headquarters, 35th Engineer Group (Construction)

(16) Bridge Trucks in Sandy Terrain.

Item: "5 ton bridge trucks.

Discussion: "It has been found that the 5 ton bridge truck, M-139, can maneuver in sandy terrain and has proven to be successful in hauling bulk cargo in sandy terrain at Cam Ranh Bay, Vietnam.

Observation: "Consideration to be given to the maximum utilization of the M-139 Bridge truck in sandy terrain."

SOURCE: Headquarters, 35th Engineer Group (Construction)

(17) Float Bridging.

Item: "Excessive deadline of outboard motors and bridge erection boats.

Discussion: "Excessive deadline of outboard motors and bridge erection boats resulted from extended periods of operation, poor site characteristics, and almost nonexistant resupply of repair parts.

Observation: "Some steps to minimize this problem:

(a) "The Float Bridge Co, being one of few companies which has the 27' bridge erection boat and the 25 hp outboard motor, should be deployed with adequate repair parts for these two items of equipment.

(b) "Utilize "fast raft adaptors" (expedient) where site conditions are unfavorable for normal rafting operations.

(c) "For extended periods of rafting operation arrangements must be made for scheduled daily maintenance regardless of the backlog of traffic.

(d) "Where conditions permit, utilize one large raft rather than two smaller rafts to minimize the required number of power boats to operate."

SOURCE: Headquarters, 35th Engineer Group (Construction)

(18) Landing Site Preparation.

Item: "Landing site preparation.

Discussion: "During extended rafting operations, landing sites receive a tremendous amount of abuse.

Observation: "Measures taken to minimize the wear and abuse of the landing ramps.

(a) "Layers of laterite and crushed stone were placed over the original sand ramps.

(b) "Two layers of pierced steel plank were laid, first layer perpendicular to the raft, and second layer parallel to the raft. It is important that the top layer be laid parallel to the raft to keep raft ramp and balk lugs from hanging in the pierced steel plank grooves and pushing or pulling the pierced steel plank.

(c) "D" handle pickets were driven along the edge of the pierced steel plank to stablize the matting."

SOURCE: Headquarters, 35th Engineer Group (Construction)

(19) Construction Drawings.

Item: "TM 5-302, Construction in the Theater of Operations.

Discussion: "If the TM 5-302 was printed on reproducible masters for use in burning and ammonia process machines, work loads of the Engineer Section could be reduced by approximately 35%. Standard details must be redrawn by a draftsman and reproduced for the construction unit.

Observation: "Recommend that in the future, Department of the Army make available standard drawings in reproducible form."

SOURCE: Headquarters, 87th Engineer Battalion (Construction)
Headquarters, 35th Engineer Group (Construction)
Headquarters, 18th Engineer Brigade

(20) Quarry Operations.

Item: "Wagon drill mobility.

Discussion: "In rough quarry sites or those where deep sand is present, the movement of wagon drills is difficult.

Observation: "Increased mobility can be obtained by mounting the wagon drill on the back of a 5 ton, M-52 tractor truck. This will also extend the reach of the drill for boring horizontal "snake holes", but reduces depth when vertical holes are bored. A primary advantage of this type mounting is that the drill can be operated and moved by a two (2) man crew."

SOURCE: Headquarters, 864th Engineer Battalion (Construction)
Headquarters, 18th Engineer Brigade

(21) Quarry Operations.

Item: "Fines recovery.

Discussion: "Testing of the aggregate produced by the secondary crusher, indicated that on arrival at the asphalt plant hopper, the aggregate lacked enough fines passing the #200 sieve. This resulted from the fines being blown away while being moved on conveyors and stock piled. Normally, this would have been solved by adding about two (2) tons of cement to each one hundred (100) tons of mix. This would have been at considerable cost and effort. It was decided to experiment with a spray bar over the conveyor on

the primary crusher. This consisted of a small pipe,over and at a right angle to the conveyor,drilled with 1/16" holes. Water was run through the spray bar resulting in a heavy drip. It was discovered that this increased the percentage of fines to 16, which fell within the necessary requirements for asphalt. It also resulted in a considerable reduction of dust at the site.

Observation: "The use of cement filler can be avoided and the aggregate fines saved by placing a spray bar on the primary crusher conveyor. This results in considerable savings in expense and effort."

SOURCE: Headquarters, 35th Engineer Group (Construction)
Headquarters, 18th Engineer Brigade

(22) Concrete.

Item: "Inadequacy of TOE equipment for large scale concrete construction.

Discussion: "The two (2),16 S concrete mixers currently authorized engineer construction companies are inadequate for large concrete pouring operations. Their output is less than required and excessive manpower is needed to operate the equipment. The use of concrete mixing batch bins which allow loading into dump trucks, coupled with a large concrete mixer with a skip which allows the dump trucks to dump directly into its skip, reduce the manpower requirements by approximately 50%. Higher quality concrete is maintained at the same time as greater production is achieved. The use of steel concrete forms also increases productivity.

Observation: "One (1) set of batch bins and a large skip form concrete mixer and approximately 2,000 feet of steel concrete forms should be added to the equipment augmentation of each engineer construction battalion."

SOURCE: Headquarters, 18th Engineer Brigade

(23) Two Shift Operation.

Item: "Two (2) shift operation of dump trucks organic to the construction platoons (Engineer Company, Construction TOE 5-118D).

Discussion: "The TOE does not provide sufficient drivers for two (2) shift operation of the 5 ton dump trucks of the

construction platoons. As a result, in order to provide a second shift of drivers, the number of personnel available for vertical construction is reduced.

Observation: "TOE capability for engineer construction units should provide sufficient personnel for two (2) shifts of operation of all authorized dump trucks and earthmoving equipment."

SOURCE: Headquarters, 87th Engineer Battalion (Construction)
Headquarters, 18th Engineer Brigade

(24) Military Roads.

Item: "Civilian contractors and the U.S. Air Force use commercial type vehicles in this Theater of Operations.

Discussion: "Commercial type vehicles require roads of a higher standard than military vehicles.

Observation: "The use of commercial type vehicles by contractors and the U.S. Air Force in a Theater of Operations requires higher standards of roads and more construction effort than would otherwise be required in the initial phases of development."

SOURCE: Headquarters, 87th Engineer Battalion (Construction)
Headquarters, 18th Engineer Brigade

(25) One Lane Roads.

Item: "One (1) lane roads are traffic hazards.

Discussion: "Two (2) lane Class Y military roads require little additional effort than that required for one (1) lane roads. Two (2) lane roads alleviate the following problems: 1) Traffic constriction for two (2) way operations. 2) Maintenance of ditches, culvert headwalls and shoulders mutilated by traffic driving in and on them, especially in wet weather.

Observation: "One (1) lane roads should be constructed only when time or other considerations specifically preclude construction of two (2) lane roads."

SOURCE: Headquarters, 70th Engineer Battalion (Combat)(Army)
Headquarters, 18th Engineer Brigade

(26) Laterite for Roads.

Item: "Laterite is untenable for unsurfaced road building without special preparation.

Discussion: "When the laterite is relatively dry (moisture content is 5% to 8%) it compacts into a hard, durable surface. However, when wet, it turns into a soapy mud. This material absorbs water rapidly over a narrow moisture range.

Observation: "If well-compacted when placed, twice the normal crown is used, and deep ditches are dug to keep the water from seeping into the base, a fairly stable surface is maintained even in the heaviest rains."

SOURCE: Headquarters, 70th Engineer Battalion (Combat)(Army)
Headquarters, 18th Engineer Brigade

(27) Sand Dune Roads.

Item: "Stabilization of dune sand roads.

Discussion: "By the use of a combination of crushed coral and crushed rock, a fairly stable surface can be established in dune type sand. While not entirely waterproof, roadway has good bearing characteristics and does not deteriorate excessively during wet weather.

Observation: "In sandy seacoast areas, Engineer Intelligence should seek to identify actual or suspected coral deposits."

SOURCE: Headquarters, 35th Engineer Group (Construction)
Headquarters, 18th Engineer Brigade

(28) Culverts.

Item: "Locally manufactured concrete culvert pipe is weaker than the U.S. product.

Discussion: "Due to the lack of adequate reinforcement and low-strength, high-yield cement-sand ratios, locally manufactured concrete culvert pipe has substantially less crushing strength than the product on which the cover requirements in FM 5-34 are based. Experience has shown that to avoid crushing, the depth of cover over this local pipe should equal the culvert diameter or a minimum of 18" rather than the standard one-half ($\frac{1}{2}$) culvert diameter or minimum 12" specified in US Engineer Manuals.

Observation: "All engineer units in Vietnam should be made aware of this lesson."

SOURCE: Headquarters, 70th Engineer Battalion (Combat)(Army)

(29) Culvert Expedient.

Item: "Use of napalm bomb containers as expedient culverts.

Discussion: "Due to the extreme shortage of culvert material and the heavy rainfall, some expedient had to be found to adequately handle the drainage problem. Napalm bomb containers are easy to install and are adequate to do the job.

Observation: "Approximately two (2) feet of cover is required when used as a culvert to prevent heavy equipment from crushing them."

SOURCE: Headquarters, 18th Engineer Brigade
Headquarters, 46th Engineer Battalion (Construction)

(30) Headwall Construction.

Item: "Headwall construction.

Discussion: "Various experiments have been conducted to determine the best expedient method for headwall construction.

Observation: "Sandbags and timber are not durable; they rot quickly. Deterioration of timber may cause vertical walls to collapse. Granite blocks, obtained from local sources, for building masonary headwalls proved to be very satisfactory. They require less time to construct, require no forming material, little concrete, and are simple and inexpensive to build utilizing local labor.

SOURCE: Headquarters, 18th Engineer Brigade

(31) Excessive Dust and Runway Erosion Under PSP.

Item: "Dust damage to aircraft and undersurface erosion.

Discussion: "The erosion of dust from below airfield surfaces due to the blast of aircraft has created a continuous maintenance problem to both aircraft and airfield surfaces. The spraying of the underlaying surface with asphalt, spreading of burlap and spraying the burlap with asphalt prior to laying PSP has helped considerably to alleviate this problem.

Observation: "The extensive use of this type material should be made standard practice in those areas where dust is a continuous problem."

SOURCE: Headquarters, 35th Engineer Group (Construction)

(32) Termite Damage.

Item: "Termites will destroy wooden members in contact with the ground.

Discussion: "Structures constructed of wood not treated with creosote or other protective compound should be constructed on a foundation of concrete or metal to prevent the wooden members from contacting the ground. Wooden members in contact with the ground will be structurally weakened within a very short period - three months in the An Khe area - by the termite action.

Observation: "All units in termite infested areas should take necessary preventative measures."

SOURCE: Headquarters, 70th Engineer Battalion (Combat)(Army)

(33) Curing Concrete.

Item: "Curing concrete.

Discussion: "Due to the high temperature in Vietnam, it is difficult to achieve proper curing of concrete. The rapid rate of evaporation of moisture causes formation of miniature hair cracks on the concrete surface. The use of sheet polyethylene has proven a satisfactory remedy for this condition.

Observations: "Heat on the surface of the polyethylene causes moisture to condense on the under surface of the material, thereby trapping necessary moisture for proper curing on the concrete. Also, the lightweight material can be applied immediately without damaging the finished surface of the concrete."

SOURCE: Headquarters, 84th Engineer Battalion (Construction)

(34) Prefabricated Wooden Buildings.

Item: "Prefabricated wooden buildings.

Discussion: "When constructing prefabricated tropical-type wooden structure buildings, it has been found that the side and end panels can be prefabricated; i. e., side or end panel laid out and joined with double plate, then the screening, kick boards and louver boards installed. The entire section is then raised into place.

Observation: "Prefabrication has reduced construction time approximately thirty percent. Construction also is allowed to continue while waiting for concrete to cure."

SOURCE: Headquarters, 84th Engineer Battalion (Construction)

(35) Sand Cement Tent Slabs.

Item: "Optimum sand - cement ratio.

Discussion: "It was found that a sand-cement ratio of 3.5 or 4 to 1 was required to provide a reliable mixture when placing slabs for tents in the Cam Ranh Bay area.

Observation: "Sand in the Cam Ranh Bay area is wind-blown sand; the grains are round, smooth, very small and poorly graded."

SOURCE: Headquarters, 35th Engineer Group (Construction)

(36) Pile Driving Hammers.

Item: "Diesel hammers.

Discussion: "The diesel pile driving hammers organic to the Port Construction Company have been found to be much more effective than a three thousand (3000) pound drop hammer. They are simple to operate and could possibly be effectively used by other units having pile driving capabilities.

Observation: "Diesel pile driving hammers should be utilized whenever possible."

SOURCE: Headquarters, 35th Engineer Group (Construction)

b. Maintenance.

(1) Mechanics.

Item: "Mechanics are assigned to US Army maintenance units in Vietnam following extended periods without practical application.

Discussion: "Upon completion of service schools, personnel trained in maintenance skills have been assigned to CONUS Field and Depot Maintenance shops which are normally staffed with civilian personnel. The military personnel do not apply those skills developed in school, except during periods of field maneuvers when civilian personnel do not normally accompany the military units. As a result, military personnel assigned to maintenance units in Vietnam have lost their proficiency and require a training period which reduces the unit's mission capability.

Observation: "School-trained mechanics should have practical experience following their schooling prior to being sent to a unit performing an essential mission in a combat area."

SOURCE: Headquarters, 1st Logistical Command

(2) Density of Equipment.

Item: "Numerous items of material handling equipment and engineer equipment are remaining on deadline for lack of repair parts in country.

Discussion: "Density of equipment has increased so rapidly that the amount of repair parts have not been able to keep up with the demand. Units were arriving in country without their PLL and with outdated equipment. In addition, equipment is not standard and requires different types of repair parts necessitating the stockage of a wide assortment of spare parts. Order-ship time from CONUS has run 135 days and over for available parts and over 200 days for parts not stocked in the supply system. The amount of equipment deadlined has considerably reduced port unloading capability and the engineer construction effort.

Observation: "Operation 'Red Ball Express' should be continued until normal supply channels alleviate the shortage of repair parts and the excessive deadline problem. Units should arrive in Vietnam with sufficient spare parts and equipment that is not approaching obsolescence. Equipment sent to the same area should be standardized to eliminate the requirement for stocking several types of repair parts."

SOURCE: Headquarters, 1st Logistical Command

(3) Obsolete Equipment.

Item: "Obsolete equipment.

Discussion: "It has been found that many units arrived in country with obsolete equipment for which it is almost impossible to obtain parts. Much of this equipment was at the point of failure when shipped at great expense and is now salvaged. This has reduced production, complicated the supply channels and has been a large expense to the Army.

Observation: "Units arriving in country should have up-to-date, standardized equipment."

SOURCE: Headquarters, 35th Engineer Group (Construction)

(4) Metal Deterioration.

Item: "Rust and corrosion.

Discussion: "Due to the prolonged exposure to salt air and high humidity, corrosion and rust accumulate at an astonishing rate.

Observation: "All metal surfaces must be either well-painted or protected by a good coat of preservative. Also, ship a large enough quantity of preservative to sustain your operation indefinitely as none is available in this command."

SOURCE: Headquarters, 23rd Artillery Group

(5) OVM.

Item: "OVM quickly rusts.

Discussion: "OVM quickly rusts due to the climate and high humidity. It is necessary for every vehicle to have a complete set as the trucks often operate singularly on lightly traveled roads.

Observation: "All OVM must be present and cleaned frequently."

SOURCE: Headquarters, 11th Transportation Battalion (Terminal)

(6) Material Readiness.

Item: "Care of tools and equipment.

Discussion: "High humidity and great amounts of rainfall in Vietnam tends to rust tools and equipment at a greater rate than experienced in the United States.

Observation: "Tools and equipment must be cared for on a daily basis. Tools must be oiled daily to prevent rusting."

SOURCE: Headquarters, 169th Ordnance Battalion

(7) Maintenance Tents.

Item: "Maintenance tents.

Discussion: "Maintenance tents are a necessity during the monsoon season in Vietnam. In order to insure against reduced efficiency and production during inclement weather, units should attempt to obtain maintenance tents by lateral transfer before departing CONUS.

Observation: "The availability of maintenance tents increases production particularly during the monsoon season."

SOURCE: Headquarters, 169th Ordnance Battalion

(8) Maintenance Shelter.

Item: "Maintenance units require more maintenance tents than TOE provides.

Discussion: "During the monsoon season, maintenance tents are required to perform maintenance operations on any item of equipment. TOE is inadequate to permit the maximum number of jobs to be in process with the number of personnel available. Floors must also be constructed in the tents to permit efficient and safe operations, especially where electrical equipment is being repaired.

Observation: "Units scheduled for an area which has a long rainy period should request additional maintenance tents and obtain drainage for floors. Locally fabricated frames with canvas stretched over them to form a shed can be constructed if maintenance tents are unavailable."

SOURCE: Headquarters, 5th Ordnance Battalion

(9) Publications.

Item: "Units must be prepared to support new items of equipment.

Discussion: "Maintenance units must be prepared to support new and different items of equipment and must constantly review the DA Pamphlet 310 series and requisition all manuals, TB's and SB's pertaining to equipment they might possibly support. Units departing CONUS for Vietnam must bring an adequate number of publications. In addition, the necessity of supporting several different operations, at different locations, simultaneously, requires a greater number of TM's than is normally required.

Observation: "Units should be advised to keep an adequate supply of publications, especially TM's, on hand, and to make constant reviews of the DA 310 Series pamphlets to keep their publications current."

SOURCE: Headquarters, 5th Ordnance Battalion

(10) Protection of Sensitive Items.

Item: "Protection of Sensitive items.

Discussion: "It has been discovered, that because of heat and humidity, sensitive items and manuals have a tendency to mildew very rapidly.

Observation: "Hot boxes provided for storage will alleviate this problem."

SOURCE: Headquarters, 169th Ordnance Battalion (M&S)

(11) Storage Batteries.

Item: "Electrolyte in storage batteries evaporates quickly.

Discussion: "Electrolyte in wet cell batteries quickly evaporates in a hot climate such as that of Vietnam. Batteries must be checked at least three (3) times weekly and filled as required if premature failures are to be prevented.

Observation: "Operators and maintenance personnel should be informed of this fact and unit motor pool SOP's should require a check of the battery at least three (3) times weekly."

SOURCE: Headquarters, 70th Engineer Battalion (Combat)(Army)

(12) Vehicle Battery Life.

Item: Reduced battery life.

Discussion: Extreme heat, intense sunshine and high operating temperatures are typical climatic conditions in Vietnam. Electrolyte in batteries "boils" more rapidly than it does under normal CONUS temperatures. The batteries in use in Vietnam seem to have a much shorter life, especially those that are allowed to "boil" over.

Observations: (1) Electrolyte strength should never be allowed to exceed the strength prescribed in the TM.

(2) The water level must be checked frequently. Care should be exercised not to over-fill a battery when replenishing with distilled water.

(3) Units deploying to Vietnam should bring extra batteries and battery acid.

SOURCES: Headquarters, 70th Engineer Battalion (Combat)(Army)
Headquarters, 525th Military Intelligence Group
Headquarters, 864th Engineer Battalion (Construction)

(13) Lubrication.

Item: Tropical conditions require more frequent lubrication of equipment.

Discussion: In the Cam Ranh Bay area maintenance problems were caused by a crust of sand and rock dust that settled upon equipment. This crust of sand and rock dust had such a "wearing" effect upon engineering equipment that lubrication time intervals for most engineer equipment were reduced by one-half. Dust, moisture, and wear and tear from routine driving also indicated a need for more frequent lubrication on wheeled vehicles. High heat, rain and mud took a serious "toll" of equipment not properly lubricated.

Observation: Lubrication should be accomplished in accordance with the applicable LO's. However, the recommended period between lubrications should be shortened to compensate for local operating conditions. In Vietnam, frequent lubrication is a "way of life."

SOURCES: Headquarters, 11th Transportation Battalion (Terminal)
Headquarters, 35th Engineer Group (Construction)

(14) Generator Maintenance.

Item: "10-KW generators are frequently damaged due to battery electrolyte leakage.

Discussion: "10-KW liquid-cooled AC generators suffer damage to the AC-voltage regulators and T-1 transformers, located directly under the batteries, due to leakage.

Observation: "Careful 1st echelon maintenance with emphasis upon electrolyte levels of batteries, cleaning of battery boxes, and/or removal of batteries from position above components described, will minimize damage."

SOURCE: Headquarters, 54th Signal Battalion (Corps)

(15) Preventive Maintenance.

Item: "Emphasis on preventive maintenance.

Discussion: "It has been discovered, that in a tropical climate, L-Maintenance must be increased. Vehicles should be lubricated after every 1000 to 1500 miles of operation.

Observation: "A preventive maintenance program to assure inspection and maintenance on a frequent basis should be formally established. The temporary program now in operation at unit level is helping reduce the deadline rate."

SOURCE: Headquarters, 169th Ordnance Battalion (M&S)

(16) Vehicle Maintenance.

Item: "Lubrication of vehicles must be more frequent.

Discussion: "Water and sand conditions in Nha Trang and other areas of RVN cause excessive vehicle wear and deadline.

Observation: "Experience indicates that lubrication and oil change at least every five hundred miles and careful 1st echelon maintenance will reduce excessive wear and failure."

SOURCE: Headquarters, 54th Signal Battalion (Corps)

(17) Power Steering Pumps.

Item: "Failure of 5 ton multifuel power steering pumps.

Discussion: "The failure rate of 5 ton multifuel power steering pumps in the Cam Ranh Bay area is on the increase.

Observation: Operators can help increase pump life by running the multifuel engine at a fast idle when steering at a halt; this will reduce wear and tear on the pump."

SOURCE: Headquarters, US Army Depot Cam Ranh Bay

(18) Generators.

Item: "Generator breakdown.

Discussion: "Many of the recent generator breakdowns can be traced to condensation of moisture inside the equipment.

Observation: "Cold generators should be run for at least ten minutes before applying a load. The circulation of air around the stator windings will tend to remove accumulated moisture."

SOURCE: Headquarters, US Army Depot Cam Ranh Bay

(19) Multifuel Engines.

Item: "Cracked heads on multifuel engines.

Discussion: "Failure to allow the engine to cool at idle speed is causing uneven cooling and frequently results in cracking of the cyclinder heads.

Observation: "Commanders and operators have been reminded that proper operation of the multifuel engines require that the engines be run at idle speed to avoid uneven cooling."

SOURCE: Headquarters, US Army Depot Cam Ranh Bay

(20) Truck, Forklift, RT.

Item: "Failure of governor.

Discussion: "Failure of the governor is caused by the weights and their shaft striking the lock ring on the center shaft and dislocating it. The weights fly out further than normal which scores the inside of the case, eventually causing a circumferential split.

Observation: "Steps are being taken to correct this fault by modification of the governor.

SOURCE: Headquarters, US Army Depot Cam Ranh Bay

(21) Filter Life.

Item: "Reduced fuel and oil filter life.

Discussion: "Climatic conditions in Vietnam, particularly heavy dust, sand and high humidity, reduce filter life by up to 50% in all cases.

Observation: "Recommended time between filter change and/or service should be decreased by 50%."

SOURCE: Headquarters, 70th Engineer Battalion (Combat)(Army)

(22) Radar Filters.

Item: "PM of radar filters.

Discussion: "Insects and sand are a major problem with radar filters. Cleanliness of these filters is essential to the maintenance of the radars. Cheesecloth is inadequate, for it causes overheating.

Observation: ""That small mesh screen placed over these filters will keep the insects out of the filters and not cause overheating."

SOURCE: Headquarters, 97th Artillery Group (AD)

(23) Trunion Bolts.

Item: "Trunion bolts on International Harvester, TD 20, tractors can be saved.

Discussion: "Trunion bolts in the TD 20 tractor become loose quite often, due to vibration during operation, and may become lost. This can be prevented by spot-welding these bolts to the nuts.

Observation: "That all units having TD 20 tractors be made aware of this lesson."

SOURCE: Headquarters, 70th Engineer Battalion (Combat)(Army)

(24) Rough Terrain Fork Lifts.

Item: "Operation of rough terrain fork lifts in soft sand causes a larger number of broken axles than when operated on a hard surface.

Discussion: "Operation of rough terrain fork lifts in soft sand, such as found on beaches, causes a large number of broken axles. Careful operation by the operator can minimize but not eliminate this. Direct Support Units should increase the number of axles to be stocked if supported units are operating in soft, sandy terrain.

Observation: "DSU's should be made aware of the increased requirement for axles. Operators must be properly trained and motivated and supervisors must insure proper driving habits by the operators. In addition, a hard stand should be constructed as quickly as possible to prevent a high deadline rate of fork lifts."

SOURCE: Headquarters, 5th Ordnance Battalion

(25) Rock Crusher Rollers.

Item: "Rock crusher rollers.

Discussion: "Because of continual operation, rock crusher rollers wear rapidly. It takes approximately five days to replace the rollers on the secondary unit of the crusher.

Observation: "The rollers can be "hardened" while they are still mounted on the rock crusher by using an electric welder and hard surface rod. This operation consumes little time, thereby reducing shut-down time. If done often enough, one set of jaws may be used for long periods of time."

SOURCE: Headquarters, 46th Engineer Battalion (Construction)

(26) Reduced Tire Life.

Item: "Reduced tire life.

Discussion: "The bad driving conditions, rough roads and heavily loaded trucks greatly reduces tire life.

Observation: "Tires must be kept properly inflated at all times and they must be frequently inspected for cuts and the presence of foreign objects."

SOURCE: Headquarters, 11th Transportation Battalion (Terminal)

(27) Flat Tires.

Item: "Rough roads cause an excessive number of flat tires.

Discussion: "The preponderance of laterite roads in Vietnam, which contain an unusually large number of rather large sharp rocks, has created a significant tire-patching problem and even a tire shortage. It was found that, by reducing the tire pressure from 70 PSI to 45 PSI, a great deal of this problem was eliminated.

Observation: "All units should be made aware of this lesson."

SOURCE: Headquarters, 70th Engineer Battalion (Combat)(Army)

(28) Volume of Tire Repair Affects Operational Capability.

Item: "Due to the high volume of tire repair, driver personnel are sometimes used for tire repair.

Discussion: "Driver personnel sometimes must be used for tire repair which directly affects operational capability.

Observation: "Use of non-driver personnel for tire repair and hire of two local nationals has reduced the magnitude of the problem."

SOURCE: Headquarters, 11th Transportation Battalion (Terminal)

(29) Wear of Tires.

Item: "Wear on wheeled tractors tires when used in laterite.

Discussion: "It has been found that laterite will cause extreme wear on wheel tractor tires.

Observation: "Tires from scraper dolly's and other non-driving

axles have been rotated to driving axles. Push dozers or one wheeled tractor and scraper pushing another must be used in order to prevent excessive wear."

SOURCE: Headquarters, 46th Engineer Battalion (Construction)

(30) Brake and Rubber Wear.

Item: "Climate and road conditions greatly increase wear of tires, tubes, and brake shoes.

Discussion: "Rough roads, dust, the interaction of hot, dry climate followed by heavy rains and mud causes rapid deterioration of vehicle tires, tubes, and brake shoes in Vietnam.

Observation: "Units with a high density of vehicles should be authorized additional stockage of tires and tubes in the unit prescribed load list."

SOURCE: Headquarters, 11th Transportation Battalion (Terminal)

(31) Brake Failure.

Item: "Vehicle service brake failures.

Discussion: "During the rainy season, vehicle brakes are subjected to extreme amounts of water and mud which leads to rapid wear of brake linings and failure of wheel cylinder.

Observation: "Anticipate an increase of approximately 60% in demands for brake shoes and wheel cylinders if vehicles are required to operate under sustained wet and muddy conditions."

SOURCE: Headquarters, 11th Transportation Battalion (Terminal)

(32) Cause of Brake System Failures.

Item: "Cause of brake system failures.

Discussion: "The prevalence of moisture and mud in this theater has a corrosive and abrasive effect on wheel cylinders and brake drums. Moisture enters the wheel cylinder and severely pits the

cylinder walls to the extent that they cannot affectively be honed smooth. The presence of mud between the brake linings and the brake drum shortens the life of the lining and scores the brake drum requiring the drum to be turned down.

Observation: "That drivers should avoid water and mud when possible and a sealed brake drum be designed."

SOURCE: Headquarters, 185th Ordnance Battalion (M&S)

(33) Maintenance Parts.

Item: "Vehicles require increased maintenance parts.

Discussion: "The demand for brake shoes, wheel bearings, wheel cylinders and CV boots are great, due to the climatic conditions in this area.

Observation: "That units on alert for this country be allowed to double their stockage in these items, or carry a sixty (60) day stockage opposing a thirty (30) day stockage."

SOURCE: Headquarters, 97th Artillery Group (AD)

(34) Repair Parts.

Item: "Availability of repair parts.

Discussion: "Many repair parts and hardware items normally available in CONUS are difficult to acquire in Vietnam. Some of these are "high mortality" items while others are necessary for the continued operation of shop trucks and other facilities. These items include:

(a) "Cutting edges and end bits (all graders and dozers).

(b) "Tires and tubes (11.00 x 20, in particular).

(c) "Hot patches.

(d) "Filters (all types for all items of equipment).

(e) "Generator parts (seals, "O" rings, etc.).

(f) "GED Pump parts.

(g) "Welding rods (arc and gas).

(h) "Steel and brass stock including angle iron and flat iron.

(i) "Brass fittings.

Observation: "Due to the difficulty involved in acquiring replacements on the above mentioned items, as large a stock as practicable should be brought with the unit."

SOURCE: Headquarters, 70th Engineer Battalion (Combat)(Army)

(35) Prescribed Load List.

Item: "Prescribed load list.

Discussion: "A unit's PLL takes on greater significance under operating conditions found in Vietnam. Replenishment time is greatly increased. In addition, the currently allocated PLL is insufficient to support operations in this theater and should be revised upward taking into consideration climatic conditions and their effect on equipment.

Observation: "In view of the length of the supply line and the difficulty in acquiring PLL replenishment, units should attempt to bring a 100% PLL plus a stock of the "high mortality" items mentioned previously."

SOURCE: Headquarters, 70th Engineer Battalion (Combat)(Army)

(36) Repair Parts for Newly Assigned Equipment.

Item: "Repair parts for newly assigned equipment.

Discussion: "After the unit was packed for shipment, the unit's equipment was withdrawn and new models of various equipment were issued with no repair parts to support it. The repair parts are not available in sufficient quantity to support the equipment as of this time.

Observation: "Either issue repair parts with the equipment or ship the unit with old equipment that the unit's PLL will support. This should also include glass and canvas as neither item is available. Other items that fall into the same category are

welding rods (both ARC and Acytelene) solder, sand paper, miscellaneous nuts and bolts, and rear view mirrors. The OVM for the equipment is another item that must be secured in such a manner that it cannot be removed. Either lock it in the tool compartment or pack it in such a manner that it is not readily identified. The equipment itself should be equipped with some type of locking device. Some methods are:

(a) "A length of chain and a padlock.

(b) "An ignition switch with key.

(c) "Welding a couple of links of chain to the steering column or a bar to lock the spoke of the steering wheel."

SOURCE: Headquarters, 23d Artillery Group

(37) Increased PLL.

Item: Increased PLL.

Discussion: (1) The 84th Engineer Battalion has observed that because of several factors the thirty day level for prescribed load list authorized units deploying to Vietnam is inadequate. The major factors causing this condition are the unusual operating conditions and inadequate stockage of parts in theater. The 84th Engineer deployed with a sixty day PLL and indicates that this has been a key factor in the battalion maintainance of a low deadline rate.

(2) The 525th Military Intelligence Group is of the opinion that authorization for a unit for a thirty day PLL is "fine" only on paper. In Vietnam however, equipment is subjected to harsh abundances of sun, dust, and rain. The group considers that a double thirty day PLL would not be excessive for Vietnam. It also recommends that at least one of the following items per unit per vehicle type, or twenty vehicle types per unit (whichever is smaller) be included in the PLL:

(a) Windshield, frame, glass wiper motors.

(b) Generator alternator.

(c) Ignition.

(d) Starter motor.

(e) Carburetors and fuel pumps.

(f) Voltage regulators and headlight units.

(g) Universal joints for M151, and parts kits.

(h) Fan Belts

(i) Windshield wiper arms and blades, 1 extra per vehicle.

(j) Grease gun, per two vehicles.

(k) Seal set, Differential, M151.

(l) Parts kits for wheel spindle (seal) M151 and (bearing) M151.

Observation: (1) That a thirty day PLL is generally found to be inadequate for Vietnam.

(2) That the PLL's of units deploying to Vietnam should be increased before they leave CONUS.

SOURCES: Headquarters, 84th Engineer Battalion (Construction)
Headquarters, 525th Military Intelligence Group

(38) PLL, ASL and Pipe Line Lengths.

Item: PLL's and ASL's should be increased.

Discussion: (1) The 46th Engineer Battalion arrived overseas with a relatively complete PLL and ASL. However, they were rapidly used up soon after arrival. The support facilities in-country were not prepared to replace these parts as rapidly as they were needed.

(2) The 18th Engineer Brigade also found that the PLL's for most of their units were inadequate soon after deployment to Vietnam.

Observation: The 46th Engineers recommends that units should be stocked with PLL's and ASL's of greater quantity prior to deployment to Vietnam so that support units will have more time to stock replacements. The brigade recommends that PLL be related to supply pipe line lengths; and that projected supply pipe line lengths should be prepared by the Army Maintenance Board for world wide application and furnished through the TAERS reporting system.

SOURCES: Headquarters, 18th Engineer Brigade
Headquarters, 46th Engineer Battalion (Construction)

(39) Universal Mission Loads (UML) Were Inadequate.

Item: "UML inadequate

Discussion: "Certain maintenance support companies, including the 85th Ordnance Co (DS) and 94th Ordnance Cp (DS), were required to maintain UML's of repair parts in CONUS to be deployed intact with the unit to support contingencies. Although the inadequacies of the list were reported on several occasions, the repair parts were solely out of date. The load was designed to support M2 carbines, M1 rifles, M38A1 ¼ ton trucks, M211 and M135 2½ ton trucks, instead of the more recently adopted items of material which are represented in this theater.

Observation: "The idea of having support units deploy with a UML is basically sound, but it must be kept current."

SOURCE: Headquarters, 185th Ordnance Battalion (M/S)

(40) Maintenance Requirements.

Item: "Maintenance requirements.

Discussion: "Lack of repair parts is one of the major factors affecting the overall construction mission of the battalion. Deadline percentages of critical engineer equipment remains high for three primary reasons. First, engineer equipment issued and sent with the unit to Vietnam was old and worn out from peacetime training operations. This equipment cannot be expected to perform with any degree of efficiency for extended periods on a 24 hour daily basis, unless a large repair parts support backup is available. Secondly, the peace time PLL issue experience for engineer equipment is not valid for operating conditions in a combat zone. Thirdly, a large float of critical engineer repair parts is not available. Equipment PLL's are generated on a usage factor based on CONUS operations; however, in a combat zone, the equipment is double shifted on a 7 day week, and the maintenance problem deadlining the equipment is generally not a repair part carried in the PLL, but rather a part that normally shows a low usage factor in CONUS. Examples are the sprocket and roller assemblies on D-8 dozers, and the wire rope requirements for dozers and scrapers.

Observation: "The observations listed below are recommended for a construction unit in Vietnam to maintain an efficient operation:

(a) "Peacetime PLL requirements should be doubled in order to support 24 hour operations of all mission essential equipment.

(b) "A basic load of repair parts, over and above the standard peacetime PLL, should accompany each unit into the theater of operations.

(c) "The basic load of wire rope, tires, fuel filters, oil filters, and air cleaner elements for construction equipment should be tripled for each unit coming into the theater, and these items should be priority items in the supply backup system.

(d) "A float stock of end items for all mission essential equipment should be available in the theater when the unit arrives.

(e) "When new engineer equipment is not available for issue to the unit, a sound repair part support backup for a period of up to 180 days is considered essential."

SOURCE: Headquarters, 62d Engineer Battalion (Construction)

(41) Lack of Repair Parts Maintenance.

Item: "The supply system is having trouble furnishing repair parts in a quantity sufficient to meet the needs.

Discussion: "There are several things that can be done to help overcome the problem. Anything that will get a vehicle off deadline or help in the supply of parts must be considered.

(a) "Raw rubber purchased on local economy utilized for hot patched and vulcanizing rips in tubes.

(b) "Refrigerator sealed units, sawed open, motors rewound then welded shut again.

(c) "Transformers, solenoids, and relays rewound when possible (units not sealed).

(d) "Adapting 5 ton truck engine to fit 10,000 pound rough terrain forklift.

(e) "Rebuilding one engine from 3, when all are the same, e.g., standard, or oversize.

(f) "Adapt M38 engine to fit M38A1.

(g) "Use modified seals and bearings when seals and bearings of the proper size are not available.

(h) "Seal bearings by fabricating seal shields and packing bearings.

(i) "Repack sealed bearings that are still good but have lost their lube.

(j) "Adapt DC generator system to commercial vehicles that had alternation systems.

(k) "Cut and machine available long axles to make short axles and extend short axles by welding on extension to make long axles.

Observation: "Every effort should be made to keep close liaison with other maintenance areas to pass on the various methods of overcoming the shortage."

SOURCE: Headquarters, United States Army Support Command, Nha Trang

c. Supply.

(1) Supply Storage.

Item: "Supplies deteriorate rapidly in Vietnam.

Discussion: "Due to the oppressive heat and high humidity in most of Vietnam, supplies stored outdoors corrode, decay and generally deteriorate far more rapidly than in the CONUS.

Observation: "Covered storage for supplies subject to rapid deterioration should be given a high priority. Maximum use should be made of CONEX containers for storage of materials of this nature until more permanent covered storage facilities are acquired."

SOURCE: Headquarters, 70th Engineer Battalion (Combat)(Army)

(2) The Supply System .

Item: "Avoiding supply system lags.

Discussion: "Under combat conditions, many normal supply procedures are disrupted by 'crash' needs which result in delays in normal transactions.

Observation: "Close and continuous liaison between unit and supply personnel of supporting units helps to minimize 'crash' requirements. Anticipation of future requirements by unit supply personnel also lessens the disruption of normal transactions."

SOURCE: Headquarters, 70th Engineer Battalion (Combat)(Army)

(3) Resupply.

Item: "Automatic resupply must be based on in-country usage factors.

Discussion: "Automatic resupply was based on CONUS usage. This criteria has caused overstockage in some areas and shortages of supplies in others. PUSH items were not shipped in unitized packs. Repair parts were mixed with major items and components of major items.

Observation: "Future automatic resupply to Vietnam should be based on in-country usage factors. If unitized packs are not available, then, as a minimum, repair parts should be separated from other classes of supply."

SOURCE: Headquarters, 1st Infantry Division

(4) Requisitioning of Equipment.

Item: "Military supply procedures often do not provide adequate equipment for a unit's misson.

Discussion: "Military personnel often feel that normal supply procedures will not provide them with equipment. Personnel resort to "scrounging" rather than requisitioning items through normal supply channels. This circumvention of supply channels results in negative demands factors with major logistical command elements.

(a) "Once demand factors have been established, equipment will be available by requisition.

(b) "Adequate lead time for new items of equipment will be given to supply channels.

(c) "Scrounging" results in shortages to units which have established demand factors for supplies, and, in a few instances, results in critical shortages.

(d) "Effective liaison should be made between unit supply personnel and major logistical command personnel to insure that policies are being followed.

(e) "Commanders should pay closer attention to supply practices within their units. Many commanders are not as cognizant of supply procedures as they should be. On occasion, they demand improper use of supply procedure.

Observation: "Supply channels will work when given a chance. If supplies and equipment are not available, the fault usually lies within the requesting units."

SOURCE: Headquarters, 525th Military Intelligence Group

(5) Stock Record Clerks.

Item: "Stock record clerks.

Discussion: "The shortage of stock record clerks has cuased a need to hire indigenous labor for clerks.

a. "Augmentation of stock record sections with indigenous labor is extremely limited to this section of RVN. Training of employees in the paperwork processing procedures is difficult and the supply of educated personnel is inadequate. An additional difficulty is presented by the necessity for the indigenous personnel meeting security requirements before being hired.

Observation: "Don't depend on indigenous labor as a 100% solution to the shortage of Army clerks."

SOURCE: Headquarters, United States Army Support Command, Nha Trang

(6) Warehouse Tractors.

Item: "There is a shortage of warehouse tractors and trailers in the supply yards.

(c) "Lack of warehouse type tractors and trailers created a difficult problem in the movement of goods in the storage yards. This headquarters authorized the use of a limited quantity of M-274 mules for in-storage yard movement of supplies.

Discussion: "The use of this type vehicle proved an excellent substitute for warehouse tractors and trailers.

Observation: "Don't rely on the arrival of TOE equipment to perform the mission."

SOURCE: Headquarters, United States Army Support Command, Nha Trang

(7) Trucks/Transportation.

Item: "Lack of adequate transportation to move supplies could be and is a hindrance in the accomplishment of the mission.

(a) "Movement of supplies from Cam Ranh Bay to Nha Trang and from Nha Trang to Dong Ba Thin and Phan Rang is almost impossible if this support command relied on normal transportation channels. This headquarters formed a provisional truck platoon by levying vehicles and personnel from attached units.

Discussion: "All vehicles, regardless of intended use by TOE should be utilized to transport supplies as required. The mission of this support command would have suffered noticeably without these vehicles.

Observation: "There is inadequate transportation to move supplies; therefore, every effort must be made to utilize all available vehicles."

SOURCE: Headquarters, United States Army Support Command, Nha Trang

(8) Conveyors.

Item: "Availability of conveyor sections.

Discussion: "Few types of material handling equipment are equipped to place or retrieve boxes or pallets from the bed of a 2½ ton truck due to the length of the bed. This unit had difficulty until three (3) sections of aluminum conveyors with ball bearing rollers were obtained for each flat bed 2½ ton truck. Pallets may now be moved by hand while on the conveyors to speed the loading and unloading operation.

Observation: "While three (3) sections are ideal, at least two (2) sections per vehicle expected to be used in a shipping/receiving situation should be issued a deploying unit or furnished upon arrival in-country."

SOURCE: Headquarters, 32d Medical Depot

(9) Use of 4x4 Pallets.

"The bulk of supplies delivered by Air Force aircraft were received on large pallets which division MHE was unable to handle. Log areas were notified that all supplies must be placed on 4x4 pallets prior to loading on Air Force 436L pallets. However, this procedure was not effective until the latter stages of the ALOC."

SOURCE: Headquarters, 1st Cavalry Division (AM)
(Extracted from a special report.)

(10) Shipping Pallets.

Item: "Weak shipping pallets.

Discussion: "Shipping pallets used for equipment going overseas are not strong enough to withstand the abuse received; and, as a result, are broken during shipment and handling with subsequent damage to the equipment.

Observation: "Shipping pallets should be strong enough to protect the equipment shipped on them."

SOURCE: Headquarters, 3d Battalion, 18th Artillery

(11) Storage of Sensitive Items.

Item: "Heat and light sensitive items require special handling.

Discussion: During early phases of operations in Vietnam, many heat and light sensitive items such as batteries and photographic supplies were shipped as automatic resupply items. At this time, covered, refrigerated, or dehumidified storage was frequently not available. As a result, many items of high value were lost.

Observation: "Recommend that these type items be kept at in-country logistic command depots to preclude damage or loss due to lack of proper field storage."

SOURCE: Headquarters, 1st Infantry Division

(12) Class I Packaging.

Item: "Class I items require special packaging.

Discussion: "B" ration components are being received and issued in domestic packaging. The high humidity and intense rains in country cause deterioration of the boxes and spoilage of the supplies.

Observation: "Recommend all "B" ration items for issue in Vietnam be packed specially for overseas shipment."

SOURCE: Headquarters, 1st Infantry Division

(13) Ration Breakdown.

Item: "Ration breakdown.

Discussion: "The operation of the Class I storage site and the ration breakdown point within the same location created extreme overcrowding problems. Vehicles coming for issues, vehicles being loaded for outlying areas, and beach clearance vehicles, together caused traffic delays. As a result, the ration breakdown was removed from the depot and given to the newly arrived Quartermaster D/S Company.

Observation: "In diverting the direct support operation from the depot activities, a smoother and more efficient supply system was obtained."

SOURCE: Headquarters, 98th Quartermaster Battalion (GS)

(14) Shortage of POL Tankers.

Item: "Operations in Vietnam require more POL tankers.

Discussion: "The current situation in Vietnam precludes the installation and use of pipelines. The authorized POL bulk-carrying capacity of a ROAD division is inadequate to meet requirements imposed by the number of separate installations, and periodic movement of large resupply convoys to support these activities. By TOE, 10 organic 5,000 gallon tankers are authorized for the S&T battalion. This is not sufficient to deliver the quantities of fuel required to the forward areas.

Observation: "The TOE of ROAD divisions in Vietnam should be increased to provide 20, 5,000 gallon tankers with tractors and personnel."

SOURCE: Headquarters, 1st Infantry Division

(15) Class IV Construction Supplies.

Item: "A need exists for some method of protecting Class IV construction supplies from the weather.

Discussion: "During the rainy season, which lasts approximately six months, many items of construction supplies are damaged or destroyed by the weather. This is particularly true of cement, plywood and lumber. Storage of vast quantities of such supplies inside buildings or warehouses is recognizably out of the question.

Observation: "Cement shipped in plastic bags is less likely to be ruined by rain than that without outer plastic bags; scrap canvas or even servicable dump truck tarps can be used to protect other supplies."

SOURCE: Headquarters, 46th Engineer Battalion(Construction)

(16) Ammunition Storage.

Item: "Inadequate drainage for open storage of ammunition causes rapid deterioration in the tropical monsoon climate experienced near Saigon, South Vietnam.

Discussion: "Wooden ammo containers stored directly on the ground in open storage, will be severely damaged by water and termites during the monsoon season.

Observation: "Adequate dunnage (wood or concrete 6x6's or 8x8's sandwiched between PSP or 2x12 lumber) will raise ammunition 8 to 12 inches off the ground. In addition to providing protection from water and termites, the dunnage provides better ammunition to ground weight distribution."

SOURCE: Headquarters, 3d Ordnance Battalion (Ammunition)

d. Transportation.

(1) Utilization of Vehicles.

Item: "A 2½ ton truck unsuitable for use with palletized cargo in conjunction with forklifts.

Discussion: "The rigid metal sides on the 2½ ton truck make it unsuitable for loading or unloading with commercial or rough terrain types of fork lifts. A stake and platform truck would greatly increase the utilization of vehicles for cargo hauling, by lowering the turn around time by eliminating the delay in loading and unloading.

Observation: "Platforms were fabricated out of 4' x 4' dunnage and PSP to raise the bed of the truck to the height of the metal sides, thereby allowing cargo to be loaded from either side by forklift. Six pallets of cargo may be loaded in this manner as opposed to two in the conventional 2½ ton truck utilization. Greater care must be exercised in driving with cargo on the platform as the center of gravity is raised about two feet higher in the truck."

SOURCE: Headquarters, 11th Transportation Battalion (Terminal)

(2) Damage to Tailgate.

Item: "Damage of tailgate securing brackets on M-35, M35A1 Cargo vehicles.

Discussion: "Many tailgate securing brackets are sheared off by forklifts during loading and unloading operations.

Observation: "Temporary replacements can be fabricated from 3/8 inch steel stock and welded into place until permanent repair can be made by support maintenance."

SOURCE: Headquarters, 11th Transportation Battalion (Terminal)

(3) Forklifts.

Item: "Commercial forklifts.

Discussion: "The commercial forklifts assigned to terminal service company, 15,000 lb and 6,000 lb, have masts too tall to be utilized in the holds of most ships. Short masted forklifts can be used to much greater advantage, even though their lifting capacity may be less.

Observation: "Short masted forklifts,if made available to ship platoons,can greatly ease and speed the discharge and backload of many vessels."

SOURCE: Headquarters, 11th Transportation Battalion (Terminal)

(4) Forklift Extentions.

Item: "Forklift extensions.

Discussion: "Forklift extensions can greatly ease the loading and unloading of palletized cargo onto trucks. Extensions can greatly reduce the damage to pallets by enabling the operator to place the load rather than push it into position.

Observation: "Forklift extensions,or metal of sufficient strength to fabricate extensions,should be made available to Terminal Service Units."

SOURCE: Headquarters, 11th Transportation Battalion (Terminal)

(5) Heavy Lifts.

Item: "Vehicle set.

Discussion: "The vehicle set of a Terminal Service Company is not sufficient to handle vehicles larger than a 3/4 ton truck. In most cases,this requires the use of the ship's equipment. Many vessels; however, do not have the needed equipment.

Observation: "Sufficient high quality metal should be made available to Terminal Service Units to fabricate necessary equipment."

SOURCE: Headquarters, 11th Transportation Battalion (Terminal)

(6) Vehicular Lighting.

Item: "Safety lighting on 2½ ton trucks is inadequate.

Discussion: "Trucks of this unit are in operation 24 hours daily. Night operations in urban areas and on the highways show the need for safety marker lights on the sides of the cargo beds.

Observation: "The accident hazard at night could be reduced by installation of marker lights on cargo vehicles."

SOURCE: Headquarters, 11th Transportation Battalion (Terminal)

(7) Trucks.

Item: "5 ton bridge trucks.

Discussion: "It has been found that the 5 ton bridge truck M-139 can maneuver in sandy terrain and has proven to be successful in hauling bulk cargo in sandy terrain at Cam Ranh Bay.

Observation: "Consideration to be given to the maximum utilization of the M-139 bridge truck in sandy terrain."

SOURCE: Headquarters, 18th Engineer Brigade

3. Signal Communications.

a. Security Clearances.

Item: "Security clearances.

Discussion: "Many teletype operators (MOS 72B20) are arriving in Vietnam with no security clearance and with no action having been initiated to obtain a security clearance. With rare exceptions, all COMCENTERS have secure on-line teletype circuits and the teletype operators must have a SECRET/CRYPTO clearance before they can be utilized in their MOS. This results in a man having to do duties other than his MOS for approximately the first 60 days after he arrives in-country."

Observation: "Require each man to initiate action for a SECRET/CRYPTO clearance as soon as he is put on orders to school for MOS 72B20."

SOURCE: Headquarters, 39th Signal Battalion

b. Initiation of Security Clearances.

Item: "Initiation of security clearances (S-2).

Discussion: "National Agency checks and background investigations were formerly initiated after the individual was assigned to a unit. This resulted in an individual not being utilized in his MOS for a period of 6 to 9 months after entry into the service.

Observation: "Since the initiation of the policy of submitting DA Form 3027 for NAC and BI while the individual is in basic training, clearances have been forthcoming and the individual effectively utilized early in his service assignment."

SOURCE: Headquarters, 41st Signal Battalion (Construction)

c. Radio and Wire Equipment.

Item: "Radio parts deteriorate rapidly in tropical climate.

Discussion: "High humidity, which characterizes the local climate, causes an unusual amount of damage to radio and wire equipment. Exposed copper surfaces corrode and exposed steel surfaces rust, thus causing a higher than average deadline rate.

Observation: "Proper storage techniques must be practiced. Equipment in use must be carefully checked daily and scheduled periodic inspection by signal maintenance should be arranged."

SOURCE: Headquarters, 19th Engineer Battalion (Combat)(Army)

d. Air Conditioning of Electrical Shelters.

Item: "Electrical shelters should be equipped with air conditioning units.

Discussion: "The high ambient temperatures encountered in RVN and the heat generated by electronic equipment installed in communications shelters results in excessively high temperatures inside the shelters. This causes equipment failures and serious loss of personnel efficiency.

Observation: "Electrical shelters housing communications electronics

should be equipped with air conditioning units prior to arrival in RVN."

SOURCE: Headquarters, 54th Signal Battalion (Corps)

e. Tactical Communication Shelters Require Air Conditioning.

Item: "Tactical communication shelters require air conditioning.

Discussion: "Equipment breakdown due to excessive heat in the last quarter has indicated a definite need for a better cooling system in communication shelters.

(1) "Shelters under discussion are the S-141 type that are commonly used to house signal equipment such as the AN/MRC-69, AN/MRC-54, AN/MSC-29, and AN/MCC-6.

(2) "The excessive heat radiated by equipment such as radio transmitters and receivers, power supplies, and other electronic equipment keep inside temperatures of shelters well above 100° fahrenheit. Internal heat of this equipment is often so high that it cannot be touched.

(3) "The excessive heat not only lowers equipment performance and dependability, but causes a safety hazard to operating personnel due to the possibility of electrical shock incurred while operating equipment with the body perspiring extensively from the heat.

Observation: "Tactical communication shelters should have portable air conditioning units installed when operating in high tempature zones."

SOURCE: Headquarters, 41st Signal Battalion (Construction)

f. Vacuum Cleaners for Electronic Equipment.

Item: "Vacuum cleaners for electronic equipment.

Discussion: "During the dry season in Vietnam, the fine dust becomes an extreme problem in electronic equipment shelters. Small electric vacuum cleaners are invaluable as a means of combating this problem.

Observation: "Small electric vacuum cleaners should be provided for electronic equipment shelters."

SOURCE: Headquarters, 69th Signal Battalion (Army)

g. Movement of Shelter-Mounted C-E Equipment.

Item: "Movement of communications equipment on a timely basis was difficult.

Discussion: "The difficulty in movement of tactical C-E equipment in shelters on 2½ ton trucks to support elements of FFORCEV, both at base camps and during tactical operations, has caused delays in providing communications support. Some reasons and problems encountered are:

(1) " Lack of adequate on/off-loading equipment at some airfields.

(2) " Aircraft not meeting scheduled pick-up times.

(3) " Aircraft aborting a mission without rescheduling.

(4) " Inadequate lead time for preparation of equipment and personnel.

(5) " When lifting shelters by helicopter, time is required to obtain proper sling assemblies.

Observation: "The problem of movement of communications equipment on a timely basis can be reduced once smaller and lighter equipment becomes available and aircraft availability can be depended upon."

SOURCE: Headquarters, 54th Signal Battalion (Corps)

h. Electrical Grounding of Communications Equipment.

Item: "Electrical grounding of communications equipment in dry sandy earth.

Discussion: "During most of the year, the weather around Nha Trang, Republic of Vietnam, is extremely dry. In order to obtain a good

electrical ground in the sandy soil, it is imperative to reach the water table located 10-15 feet below the surface of the earth."

Observation: "In order to reach the water table, three standard ground rods were welded end to end, making a rod 18 feet long."

SOURCE: Headquarters, 54th Signal Battalion (Corps)

i. Overheating of Rack Mounted Electronic Equipment.

Item: "In a tropical climate, rack mounted electronic equipment tends to overheat in an unair-conditioned shelter.

Discussion: "In cases of rack mounted equipment where there are 3 or 4 chassis, insufficient ventilation causes extreme heat to build up, resulting in overheating of the equipment.

Observation: "Each chassis can be withdrawn from the rack, as cabling allows, staggering the chassis so that cooler air is allowed to circulate through them. (The vans should be air-conditioned if at all possible.)"

SOURCE: Headquarters, 54th Signal Battalion (Corps)

j. Excessive Wear of Teletypewriter Equipment in AN/GRC-26D.

Item: "The presence of sand and dust causes extensive wear of teletypewriter motors.

Discussion: "Due to the shortage of higher echelon teletypewriter repair parts and the extensive wear of motors caused by sand and dust, a high deadline rate has been experienced.

Observation: "Less wear of equipment is effected if the selector switch is placed in the "motor stop" position during the time that traffic is not being passed."

SOURCE: Headquarters, 54th Signal Battalion (Corps)

k. Static Vehicular Mounted Communications Equipment.

Item: "That vehicles parked at communications sites are subjected to damage of brakes and drive trains.

Discussion: "It is necessary to park vehicular mounted electronic equipment at communications sites for extended periods of time. Due to the inter-connection of power and signal cables, it is impossible to exercise the vehicles. Under the circumstances, brakes tend to rust and become frozen. Furthermore, drive trains become rusty and stiffen due to lack of lubrication.

Observation: "Vehicles should be blocked underneath the axles so as to allow free turning of the wheels and periodic exercise of the drive train."

SOURCE: Headquarters, 54th Signal Battalion (Corps)

l. Heavy Duty Switchgear.

Item: "Heavy duty switchgear.

Discussion: "Signal operations require AC power switchgear to switch between one generator and another in order to maintain uninterrupted communications. Small (5 to 10KW) generators come in sets of two, mounted on trailers, with appropriate switchgear as a part of the complete trailer-generator set. Larger generators which have been requisitioned to consolidate site power requirements, do not come with the necessary heavy duty switchgear, resulting in the use of inadequate switchgear taken from the smaller sets or requiring that post engineers install switchgear.

Observation: "Requisition the necessary heavy duty switchgear along with the generators."

SOURCE: Headquarters, 39th Signal Battalion

m. AFRS Broadcasts.

Item: "AFRS broadcasts.

Discussion: "AFRS is broadcast from only a few widely scattered areas using nonstandard equipment. Reception is generally poor, and electronic failures generally result in long down-times because the equipment must go to Saigon for repair.

Observation: "Rebroadcast AFRS on FM using AN/TRC-24 radio equipment. Channels A-153 through A-200 and B-1 through B-16 lie in the FM broadcast band. FM broadcast receivers are plentifully available in the Post Exchange. The equipment (AN/TRC-24) is military standard A, available through military supply channels, and easily repaired. Trained operators are readily available in this theater. One AN/TRC-24 will easily cover the average military installation in Vietnam."

SOURCE: Headquarters, 39th Signal Battalion

n. Sheltered Equipment Versus Flexibility.

Item: "Requirement for non-sheltered and sheltered signal equipment.

Discussion: "Current TOE for most signal units provides for sheltered signal equipment configurations such as AN/MRC-69, AN/MTC-1, AN/MSC-29, etc. This equipment is designed to be transported by 2½-ton truck, or heavy lift aircraft. In Vietnam, use of roads is virtually nonexistent and heavy lift aircraft are not always available for timely use. The fact that a signal support company organized under TOE 11-117R with non-sheltered equipment was attached to this organization, enabled this battalion to use organic light helicopter airlift to provide immediate installation of critical communications.

Observation: "That a balance of non-sheltered and sheltered equipment is necessary in remote areas to provide flexibility in employment of communications."

SOURCE: Headquarters, 41st Signal Battalion (Combat Area)

Section IV

A SUMMARY OF LESSONS LEARNED

"GENERAL"

1. The Operational Environment.

a. Sand Dust in C-E Equipment.

Item: "Blowing dust and sand causes excessive equipment deterioration.

Discussion: "In most of the operating sites in II CTZ, a considerable amount of sand and dust blows into equipment shelters and into equipment racks. This clogs ventilating ducts, causes abnormal wear on rotating parts (bearings, motor brushes, etc) and results in erratic malfunctions of switch and relay contacts.

Observation: "Air conditioning vans, so that they can be kept closed, will reduce this problem. Small, hand-portable vacuum cleaners are needed to remove as much dust and dirt as possible before it accumulates to excessive levels."

SOURCE: Headquarters, 54th Signal Battalion (Corps)

b. Heliports.

Item: "Unimproved heliports create a safety hazard to equipment and personnel.

Discussion: "Unimproved heliports are a safety hazard due to the tremendous amounts of dust and grit blown up by rotor downwash. Dust and grit blown up is sufficiently thick to obscure pilot visibility during landings and take offs, and to cause damage to helicopter engines.

Observation: "If areas used for heliports cannot be asphalted or oiled, grass cover should not be removed. This grass cover will reduce the amount of dust and grit blown up by rotor downwash."

SOURCE: Headquarters, 3d Ordnance Battalion (Ammunition)

c. Dust Damage.

Item: "Dust damage to aircraft and subgrade surface erosion.

Discussion: "The erosion of dust from below airfield surfaces due to blast of aircraft has created a continuous maintenance problem to both aircraft and airfield surfaces. The spraying of the underlying surface with asphalt, covered with burlap, and spraying the burlap with asphalt prior to laying PSP has helped considerably to alleviate this problem.

Observation: "The extensive use of this type material should be made standard practice in these areas where dust is a continuous problem.

SOURCE: Headquarters, 18th Engineer Brigade.

d. Dust Palliative.

Item: "Utilization of Boat Oil for dust palliative.

Discussion: "Dust is one of the major problems encountered in RVN. Laterite, the predominantly accessible road building material, tends to pulverize when subjected to traffic, thus producing a dust layer which reduces visibility, posing a safety hazard. It causes wear on vehicles, and antagonizes the local inhabitants. Boat Oil #9150-231-6654 or 6655, applied in the following manner, has proven an effective means of controlling dust.

(1) "Means of application: Asphalt distributor.

(2) "Application rate: 0.25 gallons per square yard.

Observation: "The oil penetrates to approximately ¼ inch. The surface produced is extremely impervious to water, dust free, and stands up well under heavy traffic. The surface, however, remains slippery for a minimum of two (2) hours after application. Recommend that oil be applied to only one (1) side of roadway at a time, and that the inherent hazard be publicized."

SOURCES: Headquarters, 18th Engineer Brigade
Headquarters, 84th Engineer Battalion (Construction)

e. Cultural Communication.

Item: "Cross-cultural communication.

Discussion: "Although cross-cultural communication has been emphasized in counterinsurgency and military assistance advisor training, the results have been disappointing. The number of US personnel, with adequate and useful knowledge of the Vietnamese language and culture, ranges from limited to virtually non-existent, particularly in tactical units. This limits the ability of: US unit commanders to communicate effectively with Vietnamese counterparts; advisors to influence counterparts; and of intelligence personnel to exploit the most profitable sources of intelligence information (e.g. captives, local populace and captured documents).

Observation: (1) "More US personnel must be trained as experts in Vietnamese language and culture.

(2) "The use of ARVN interpreters should be considered as being only a stop-gap measure.

(3) "It should be recognized that the use of the interpreters and translators presently available will result in some degree of misunderstanding when contact is made between US and RVN representatives.

SOURCE: Headquarters, I Field Force Vietnam

f. Indigenous Labor Support.

Item: "Value of indigenous labor.

Discussion: "The value of utilizing indigenous labor whenever and wherever possible cannot be overemphasized. It is estimated that laborers, scullery workers, masons and carpenters are about one half (½) as productive as the American soldier.

Observation: "It is valuable supplement to the troop effort to employ the maximum number of indigenous laborers that can be effectively supervised that the local area can supply."

SOURCE: Headquarters, 18th Engineer Brigade

g. Indigenous Personnel.

Item: "Hiring of indigenous personnel.

Discussion: "Units newly arrived in Vietnam often immediately hire indigenous employees. Units often hire personnel who have not been cleared by the local Vietnamese police officials. This practice is dangerous for a unit because they may be freely admitting enemy agents into their compounds.

Observation: "All indigenous personnel hired by US Forces should be cleared and be authorized access to a US installation prior to being hired. This clearance is granted by local police officials. The hiring of indigenous personnel should be coordinated by a unit personnel officer."

SOURCE: Headquarters, 525th Military Intelligence Group

h. Indigenous Labor.

Item: "Value of indigenous labor.

Discussion: "The value of utilising indigenous labor, whenever and wherever possible, cannot be over emphasized. The 159th Engineer Group is presently engaged primarily in construction support for combat units and for constructing logistical facilities. The group is presently employing approximately 1225 Vietnamese laborers on a six-day per week basis. It is estimated that laborers, scullery workers, masons, and carpenters are about one-half as productive as American soldier labor.

Observation: "Indigenous laborers are a valuable supplement to a unit. This group employs the maximum number of indigenous laborers that it can efficiently supervise; and that the local areas can supply."

SOURCE: Headquarters, 159th Engineer Group (Construction)

i. Use of Refugee Labor.

Item: "Hiring refugee labor instead of hiring local labor.

Discussion: "US units in Vietnam occassionally hire Vietnamese refugee laborers instead of local Vietnamese laborers. Some refugees

are very willing to work directly for US units because of the relatively good wages.

Observation: "The policy of the Vietnamese government is generally to induce refugees to return to their villages. If US units don't coordinate with local Vietnamese government officials they may unwittingly counteract governmental policy."

SOURCE: Headquarters, 84th Engineer Battalion (Construction)

j. Indigenous Labor for Open Messes.

Item: "Hiring of indigenous labor for open messes.

Discussion: "Nonappropriated fund activities are competing with each other for skilled and semi-skilled personnel, such as cooks, bakers, bartenders, cashiers and bookeepters; all of which are in short supply. This competition is causing the wage scale to become out of line with the VGS wage scale recommended.

Observation: "A need for a firm wage scale to be followed by all US activities."

SOURCE: Headquarters, US Army Support Command Nha Trang

k. Security Clearances.

Item: "Security clearances for local Vietnamese nationals.

Discussion: "USARV directives require a Vietnamese national to have a security clearance from the Vietnamese government prior to being hired. There are some exceptions to this policy. Security clearances are issued by the Military Security Service (MSS) of the Vietnamese government. The average time required to process a clearance is thirty days; however, some take much longer because of a processing backlog. USARV Directive 690-2 authorizes units to hire local nationals without clearances with below listed stipulations.

(1) "Must work under guard.

(2) "The unit commander must decide if the mission accomplishment is worth the risk involved.

(3) "The hiring has been initiated.

(4) "The MSS Clearance has been initiated.

Observation: "The Military Security Service (MSS) has a low sabotage incident record wherever their services has been utilized. Personnel hired without security checks should be kept at a minimum."

SOURCE: Headquarters, US Army Support Command Nha Trang

l. Boots and Fatigues.

Item: "Wear-out period for boots and fatigues.

Discussion: "Experience in some units has shown that wear-out period for boots and fatigues is only three weeks under adverse conditions. Fatigues tear and rip frequently and boots rot from constant dampness.

Observation: "Requisitioning objective should be increased to assure adequate stockage."

SOURCE: Headquarters, I Field Force Vietnam

m. Clothing Deterioration.

Item: "Rapid deterioration of boots and clothing.

Discussion: "The heat and humidity accelerate deterioration of boots and clothing. Some personnel required replacement boots and clothing less than thirty days after arrival in the theater. In most instances, personnel had been deployed from CONUS with partly worn, but serviceable, boots and clothing.

Observation: "Higher standards of serviceability must be established for the equipment of personnel coming to Vietnam."

SOURCE: Headquarters, 23d Artillery Group

n. Identification Tags.

Item: "Identification tags.

Discussion: "Replacement of lost identification tags is of major importance. While this unit has equipment to imprint identification tags (non TOE), the nonavailability of identification tags has been critical.

Observation: "Battalion size units should be authorized equipment to produce identification tags. Identification tag blanks in sufficient numbers should be obtained prior to departure."

SOURCE: Headquarters, 23d Artillery Group

o. Tropical Boots.

Item: "The brown tropical boot, FSN's 8430-286-5237 to 8430-286-5238, frequently wears out in two or three weeks.

Discussion: "It is apparent that many of these items have been in storage for several years and have dry-rotted. Although the boot will last several months in dry weather, if it is exposed to alternate wettings and dryings, the sole cracks, making the boot unserviceable.

Observation: "The black tropical boot FSN's 8430-889-3567 to 8430-889-3617, gives satisfactory service even under the worst conditions."

SOURCE: Headquarters, 46th Engineer Battalion (Construction)

p. Improved Rainwear.

Item: "Rainsuits are preferred over ponchos and raincoats.

Discussion: "Rainwear acquires added importance in a country like Vietnam. The presently issued rainwear, however, has numerous disadvantages such as restricting body movements during manual labor and failing to protect adequately around lower extremeties. The rain suit, on the other hand, provides full protection, maximum working freedom and costs very little more than the issued rainwear.

Observation: "All troops should be issued a light-weight, two-piece rainsuit, at least while in Viet Nam."

SOURCE: Headquarters, 70th Engineer Battalion (Combat)(Army)

q. "Fatigue Jacket Sleeves.

Item: "Fatigue Jacket Sleeves.

Discussion: "Shortened fatigue jacket sleeves are a necessary requirement for comfort in tropical climates. However, it is neither authorized or wise to cut them off. Some recently issued fatigue jackets of the type with the buttoned cuffs (not the so-called "jungle fatigues") are so tight that it is difficult or impossible for persons with certain body configurations to roll the sleeves.

Observation: "All personnel should assure themselves that the fatigues they acquire have sleeves loose enough to allow them to be rolled well above the elbows."

SOURCE: Headquarters, 69th Signal Battalion (Army)

r. Weapons/Maintenance.

Item: "Weapons, tools, and other items made of steel rust quickly in the humid climate of Vietnam.

Discussion: "Weapons, tools, and other items made of steel quickly rust in Vietnam. Daily care of these items is required to prevent their deterioration from rust. "Hot boxes" utilizing a small light bulb will provide a dry atmosphere for the storage of these items.

Observation: "All personnel should be made aware of the increased care the weapons and tools require to keep them in proper condition. Constant checks by NCO's and officers are necessary to insure this care is provided."

SOURCE: Headquarters, 5th Ordnance Battalion

s. Tentage.

Item: "Tentage of all types, both TOE and TA, used by units in RVN becomes unserviceable after about one year.

Discussion: "Fast wear-out of tentage is a result of dry rot caused by constant exposure to extreme conditions of dry heat and dust during the dry season.

Observation: "Semi-permanent frame buildings with louvered sides have a much longer life-span than tentage and will probably be more economical."

SOURCE: Headquarters, 46th Engineer Battalion (Construction)

t. TA Equipment.

Item: "Unit operations are seriously hampered by lack of TA items such as office furniture and refrigeration equipment, which are normally avialable in CONUS; morale and welfare are detrimentally effected by lack of such TA items as mattresses, mess trays and other convenience items normally available in CONUS.

Discussion: "While it is generally recognized that units should be able to subsist in the field with only TOE equipment, it should also be readily apparent that units can operate more efficiently with these TA items normally associated with CONUS garrison operations. Logistical units and even combat units when not engaged in operations are living in cantonment areas where these TA items would be put to good use and would increase unit proficiency and morale.

Observation: "Some units have deployed from CONUS with an ample supply of TA equipment and have benefited from so doing."

SOURCE: Headquarters, 46th Engineer Battalion (Construction)

2. Deployment.

a. Unloading of Equipment.

Item: "Unit personnel attendant at unloading of equipment.

Discussion: "When the equipment for this unit was being unloaded at Qui Nhon, battalion representatives maintained a 24 hour a day watch over all equipment being unloaded. As a result, all of our equipment was promptly and properly recognized and secured. Other units who did not have representatives on the beach had equipment missing.

Observation: "All units having equipment being unloaded from a vessel should maintain representatives at the unloading site until such time as they have received all of their equipment."

SOURCE: Headquarters, 3d Battalion, 18th Artillery

b. Hand Baggage.

Item: "Baggage hand carried aboard surface transport.

Discussion: "In many instances troops boarded the transports with so much baggage that more than one trip up and down the narrow gang-plank was necessary. This caused many interruptions and dealyed the name check, count and boarding of the troops. During debarkation the

same problems were encountered. In addition, troop compartments and and cabins became so crowded that it was necessary to store hand baggage in an empty compartment, thus necessitating an additional guard post and additional men to the Police and Sanitation detail.

Observation: "That troops, prior to leaving home station, strictly adhere to the authorized amount of hand baggage allowed aboard a surface transport."

SOURCE: Headquarters, 525th Military Intelligence Group

c. Special Equipment.

Item: "Issuance of special equipment.

Discussion: "Units deployed to Vietnam are frequently required to clear living or tactical areas of brush and trees. The issuance of chain saws to units greatly facilitates such clearing. Units are also required to conduct ground reconnaissance along insecure roads. If the vehicles of the reconnaissance parties were equipped with pedestal mounts, the safety and firepower of the parties would be greatly enhanced.

Observation: "Units being deployed to the Republic of Vietnam should be issued chain saws and pedestal mounts prior to their departure from CONUS."

SOURCE: Headquarters, 3d Battalion, 18th Artillery

d. Carpenter Kit Additions.

Item: "Carpenter kits are not adequate.

Discussion: "Prior to deployment a unit should augment its basic carpenter tool kit with the purchase of a hand power saw. Many self-help projects are facilitated by the use of such a tool.

Observation: "Power saws facilitate many self-help construction projects."

SOURCE: Headquarters, 23d Artillery Group

e. Health and Welfare.

Item: "Health and comfort items.

Discussion: "Experience has shown that refrigerators, lumber, water pumps and pipes (for shower facilities), nails, washing machines, and recreation equipment are hard to obtain in Vietnam. Unit Commanders should strive to obtain an adequate supply of the above mentioned items before departing CONUS.

Observation: "The availability of the above mentioned items plays an important role in providing for the health and welfare of the men. If the men have high morale, your unit will have higher production."

SOURCE: Headquarters, 169th Ordnance Battalion (M&S)

f. Immunizations.

Item: "Lack of required immunizations.

Discussion: "Disease is prevalent in Vietnam. Because of primitive sanitary conditions and practices of the native populance, special emphasis must be placed on obtaining required immunizations. Some personnel have arrived from CONUS without plague or other required immunizations.

Observation: "Personnel should receive required immunizations prior to arrival in Vietnam."

SOURCE: Headquarters, 54th Signal Battalion (Corps)

g. POM Requisitions.

Item: "POM requisitions.

Discussion: "The 79th Ordnance Detachment was administratively supported by another organization prior to deploying overseas. Many items which were requisitioned for the detachment during its POM were not received. The due out copies of these requisitions were retained by the supporting unit and the detachment lacks the necessary information to trace the requisitions.

Observation: "Commanders at all levels must possess all information pertaining to due out requisitions prior to departing their home station."

SOURCE: Headquarters, 97th Artillery Group (AD)

h. POM Logistical Support.

Item: "POM of support organizations.

Discussion: "During the occupation and emplacement phase of an overseas movement, a large amount of supply and maintenance support is required especially in a missile system.

Observation: "To provide this support, the DS Platoons and the GS Maintenance and Supply unit should be sent in advance of the main body. In this way, the firing batteries could be given the maximum amount of support when they arrive which would result in a maximum amount of time for them to become operational."

SOURCE: Headquarters, 97th Artillery Group (AD)

i. Unit Records.

Item: "Unit records.

Discussion: "All unit records are required as soon as a unit arrives in-country.

Observation: "Unit records have been shipped in Red TAT and air shipment to follow the unit at a later date. This allows the possibility of records being lost or arriving in-country after they are required.. All records should be carried as Yellow TAT."

SOURCE: Headquarters, 588th Engineer Battalion (Combat)(Army)

j. Medical Screening.

Item: "Medical screening.

Discussion: "An excessive number of personnel have been evacuated to field and station hospitals for observation and tests within a short period of time after unit arrives in-country. In some cases, personnel have been evacuated to CONUS within 60 days of arrival in-country.

Observation: "A more complete physical examination for personnel assigned to Vietnam is required, especially for those that have a history of ailments that would be aggravated under combat or weather conditions."

SOURCE: Headquarters, 588th Engineer Battalion (Combat)(Army)

k. Advance Party.

Item: "Advance party.

Discussion: "The advance party to Vietnam was limited by higher headquarters to a total of 5 for the battalion.

Observation: "To make necessary coordination and proper preparation for the arrival of a battalion-size unit, the advance party should consist of at least 5 persons per line company and 7 persons for battalion headquarters. This party should have organic transportation upon arrival in-country."

SOURCE: Headquarters, 588th Engineer Battalion (Combat)(Army)

l. Sponsor Unit.

Item: "A sponsor unit is an immense aid to the orderly movement and settlement of a unit overseas.

Discussion: "Each incoming unit should have a sponsor unit. If the sponsor unit serves no other purpose than to write to the unit while it is still in CONUS, obtain information on the arrival of the advance party and any unit impediments that is scheduled to arrive before the advance party, and to prepare for the unit's arrival and safe transit to their ultimate location, they have made a valuable contribution. This battalion had no sponsor.

Observation: "A sponsor unit should be appointed for each unit deploying into an overseas area.

SOURCE: Headquarters, 54th Signal Battalion (Corps)

m. "AT" Numbers.

Item: "Assignment of "AT" numbers prior to unit departure from CONUS.

Discussion: "If a unit received its in-country "AT" number before its departure from CONUS, requisitions could be submitted for PLL shortages. In this way, the two-month period in which the unit is in transit is not lost time in receiving fill on PLL.

Observation: "Units should be assigned "AT" numbers before leaving CONUS."

SOURCE: Headquarters, 54th Signal Battalion (Corps)

n. Unit Movement.

Item: "Some units are moving on a PCS without utilizing an advance party.

Discussion: "Experience shows that units arriving in-country having an advance party are better prepared to assume an assigned mission.

Observation: "In order to cut down on confusion associated with a newly arriving unit, all units on a PCS move should be required to send an advance party to establish necessary liaison."

SOURCE: Headquarters, 3d Ordnance Battalion (Ammunition)

o. Advance Party.

Item: "A group headquarters, upon notification of deployment to Vietnam, should attempt to dispatch an advance party to that country.

Discussion: "The 29th Quartermaster Group had not dispatched an advance party to Vietnam prior to its arrival in-country. Unforeseeable problems regarding local security, organization, mission requirements, and troop positioning were thus encountered. These problems had to be dealt with simultaneously while assuming the mission of supporting tactical and non-tactical units in the area.

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This headquarters, through prior planning, could have met these problems with more preparedness if it had sent an advance party to its ultimate destination in Vietnam. More time and effort could then have been expended upon its arrival in assuming the support mission.

Observation: "Units of battalion size and higher should dispatch advance parties to Vietnam in order to prevent total unpreparedness for meeting unforeseeable problems."

SOURCE: Headquarters, 29th Quartermaster Group

p. Advance Party Composition.

Item: "Advance party composition.

Discussion: "The battalion advance party was able to accomplish a great deal because of its size and composition. The make-up included key personnel from each section and company. Because of such a composition, particular needs were anticipated to allow for an orderly reception of the main body. In addition, a significant amount of "on the ground" planning was accomplished.

Observation: "It is recommended that the battalion commander, his major section chiefs, and the company commander or the executive officer of each company be in the advance party."

SOURCE: Headquarters, 168th Engineer Battalion (Construction)

q. Troop Moves.

Item: "Large troop moves require maximum mobility of the incoming unit.

Discussion: "To help provide as much mobility as possible, the Supply and Transport Battalion equipment of a division should be aboard the first cargo ship in a unit move. When unit moves depend upon trucks normally in port and beach clearance, the total port capability is seriously reduced.

Observation: "Future unit moves of brigade size and larger should load unit vehicles and the Supply and Transport Battalion equipment for discharge in the first cargo arrivals."

SOURCE: Headquarters, 4th Transportation Command

r. Plywood Containers.

Item: "Plywood Containers.

Discussion: "For overseas movement, mounted generators, mounted reel units and vehicle windshields should be boxed in plywood containers. This protects equipment and glass from hazards of movement and, in addition serves as an excellent source of wood upon arrival in combat zone."

Observation: "Pack windshields and mounted equipment with plywood frames for overseas movement."

SOURCE: Headquarters, 69th Signal Battalion (Army)

s. Preparation of Vehicles.

Item: "Preparation of vehicles for overseas shipment to include documentation.

Discussion: "Neither AR 220-10, nor USCONARC Pam 700-1, provide clear instructions as to how vehicles and equipment will be prepared for shipment, nor do they detail all documentation that is required. Therefore, different instructions were issued for the preparation of unit impedimenta by Post Transportation and Engineer personnel.

Observation: "Clear and concise instructions needed to prepare and ship vehicles and equipment for overseas deployment should be assembled in one reference publication."

SOURCE: Headquarters, 54th Signal Battalion (Corps)

t. Classified Material.

Item: "Transporting classified material between theaters.

Discussion: "Classified material accompanying a unit moving from one theater to another may be transported by mail or by unit carrier. Quite often, a unit's first intended address is changed enroute to meet certain contingencies. Classified material mailed to this unit may not reach it for several weeks due to the relocation.

Observation: "Units requiring classified material to conduct operations should appoint a courier and sufficient guards to hand-carry classified material with the unit."

SOURCE: Headquarters, 525th Military Intelligence Group

u. Equipment.

Item: "Full TOE and TA equipment.

Discussion: "All units should deploy with full TOE and TA equipment. Units within this group deployed with serious shortages of both. For example, the Group Headquarters is authorized nineteen typewriters and deployed with only seven. The reason given for not issuing them was they would be issued in country. The Group Headquarters has been in Vietnam for almost five months now and still does not have the typewriters. This shortage has handicapped us in carrying an administrative workload estimated as being 50% to 100% greater than stateside."

Observation: "Precautions should be taken to prevent uninformed supply personnel in the States from disseminating erroneous information on these matters, and to insure that units ship out with all authorized equipment."

SOURCE: Headquarters, 159th Engineer Group (Construction)

v. Lack of Proper Deployment Information.

Item: "Lack of general supplies to support provost marshal activities, (i.e., per individual company).

Discussion: "Battalion TO&E inadequate for demands upon arrival in USARV. Inaccuracy and inconsistency of information pertaining to equipment needed by the battalion for overseas shipment.

"Virtually no preparation was provided for PMO Office set-up upon arrival in country. Units were forced to divide 30 day basic load of office supplies and equipment due to formation of a PMO, causing an acute shortage of the following listed items:

(1) Typewriters
(2) Field Desk Chairs
(3) Rectifiers
(4) Lighting Sets

(5) Generators
(6) All office supplies
(7) Tentage

"All above listed supplies and equipment could have been brought from CONUS to USARV if battalion mission had been known prior to departure from CONUS. Units are still operating with shortages of typewriters, rectifiers, field desks and generators.

Observation: "Recommend that detailed information be given to all units (if available) prior to departure from CONUS as to type of mission, and excess equipment that will be needed by unit that is not available for issue in country."

SOURCE: Headquarters, 504th Military Police Battalion

w. Additional Equipment.

Item: "Housing and messing equipment to accompany troops into the theater.

Discussion: "This battalion has been hampered by a lack of tentage and refrigeration equipment during its time in this theater. Lead times are so long on these items in theater that proper cantonment areas cannot be developed, which in turn, has an adverse effect on the morale, health and welfare of the troops. These items could have been furnished in CONUS and shipped with the unit, thus, assuring housing and refrigeration necessary for proper mess operation, particularly in remote areas such as Phan Rang.

Observation: "All items necessary for proper housing and messing of engineer troops on a static construction mission should be furnished the unit prior to movement from CONUS. These items should be incorporated in with the TAT shipment which would insure that the unit needs are met as soon as possible, and decrease the logistical load on the theater supply lines."

SOURCE: Headquarters, 62d Engineer Battalion (Construction)

x. Adequate Supplies.

Item: "Deployment with adequate supplies and equipment.

Discussion: "Units deploying to Vietnam often neglect to bring sufficient quantities of certain supplies and equipment because they anticipate that ample stocks will be available for immediate issue upon arrival. The supply system is coordinated by the mass influx of personnel and equipment

that it takes time to stockpile sufficient quantities and provide a smooth and continuous flow to all customers. Example of some critical items are:

(1) "Repair parts for all Tech Services.

(2) "Office supplies and blank forms.

(3) "Tools and test equipment.

(4) "Troop health, welfare, and morale items.

Observation: "Units should deploy with sufficient equipment so as to be self-sufficient for a minimum of ninety days."

SOURCE: Headquarters, 41st Signal Battalion (Combat Area)

y. Tactical Deployment.

Item: "Tactical deployment to overseas area.

Discussion: "The battalion deployed to Vietnam under administrative conditions. The equipment, minus TAT, preceded the unit by two weeks and was off-loaded at one port while the personnel disembarked at another. Loss of equipment and capability to assume completely the assigned mission resulted. Having units deploy under tactical conditions would provide simultaneous arrival and common disembarkation of both personnel and equipment. The possibility of equipment loss would be reduced and the unit would be capable of assuming its mission with a minimum loss of time.

Observation: "Tactical deployment from CONUS should be employed to the maximum extent possible."

SOURCE: Headquarters, 41st Signal Battalion (Combat Area)

z. Batteries

Item: "Dry cell batteries.

Discussion: "This organization experienced a high usage rate on dry cell batteries while in Vietnam. The hot, humid climate in Vietnam reduced the life of dry cell batteries to 1/3 of their expected life. The high usage rate experienced resulted in the supply of on-hand batteries being used in a short period of time.

Observation: "Units should bring a sixty (60) day issue of dry cell batteries to Vietnam. Units moving to the Republic of Vietnam should be warned of the increased need for dry cell batteries."

SOURCE: Headquarters, 97th Artillery Group (AD)

aa. Battery Acid.

Item: "Vehicular equipment is not always shipped with battery acid with which to activate uncharged, wet cell batteries.

Discussion: "Vehicles are often received with wet cell batteries in the uncharged state, less electrolyte. Often, separate containers of acid do not accompany the equipment for battery activation. Local supplies are not sufficient to accomplish this task. Therefore, vehicles must be held in very limited port vehicle holding areas longer than is necessary until adequate amounts of battery acid can be obtained.

Observation: "That vehicular equipment shipped with dry batteries should be accompanied with a plastic container of electrolyte with which to activate the battery."

SOURCE: Headquarters, 11th Transportation Battalion (Terminal)

bb. Insert Packing.

Item: "Proper handling of cardboard inserts."

Discussion: "The rough handling that the TAT cardboard inserts received at the various docks caused many of them to break open, causing damage and loss of contents.

Observation: "More and tighter banding of the cardboard inserts during preparation for overseas movement would lessen the chance of an insert coming apart."

SOURCE: Headquarters, 525th Military Intelligence Group

cc. Cardboard Inserts.

Item: "Damaged cardboard inserts due to exposure to the elements.

Discussion: "Quite a few cardboard inserts were shipped separately, inclement weather caused their deterioration during shipment and upon arrival.

Observation: "Ship all cardboard inserts in a conex container."

SOURCE: Headquarters, 23d Artillery Group

dd. Tie-Down Devices.

Item: "Air Force nylon tie-down strap with ratchet makes an excellent tie-down device.

Discussion: "The ratchet device on the nylon tie down straps can quickly be adjusted tightly by one driver.

Observation: "Less load shift and cargo loss has occured since this unit started using these tie-down devices."

SOURCE: Headquarters, 11th Transportation Battalion (Terminal)

ee. Expendable Supplies.

Item: "Inadequate expendable office and cleaning supplies.

Discussion: "The burden of office work is still necessary and the proper office management and current up-to-date records must be continued. Our sixty day supply of office supplies was not sufficient.

Observation: "That at least a ninety day supply of office and cleaning expendables be brought with the units when deployed."

SOURCE: Headquarters, 97th Artillery Group (AD)

ff. Requisition of Blank Forms.

Item: "Blank form requisitions are not being filled.

Discussion: "Of six requisitions submitted over a six month period, only two have been partially filled. No military pay vouchers have been received since arriving in country.

Observation: "That, to accomplish a unit's mission, an ample supply of blank forms be taken by the unit when departing CONUS."

SOURCE: Headquarters, 46th Engineer Battalion (Construction)

gg. Log Books.

Item: "Log books.

Discussion: "On movement overseas, most equipment will be placed into use soon after arrival. In order to increase readiness of all equipment and to maintain proper records of its use, log books should be packed and secured with the equipment to which they pertain.

Observation: "Pack equipment log books with the equipment."

SOURCE: Headquarters, 69th Signal Battalion (Army)

hh. Tent Pitching.

Item: "Normal tent pitching procedures are not suitable for tropical climates such as that in the Republic of Vietnam.

Discussion: "If tents are pitched with the aprons free to be rolled up according to current instructions, the hard driving rains will come in under the sides of the tent. Dropping the apron results in raising the temperature inside the tent. The solution used locally is to use 8-foot steel pickets rather than tent pegs. These pickets are angled away from the tent, and so that four feet of the picket protrudes from the ground. Tent ropes are secured to the pickets at a point three and one half feet above the ground, and then the aprons are secured to the pickets. This procedure results in more useable floor space inside the tent, less danger of rain blowing in, and adequate ventilation. If desired, shelter halves may be used to secure the "V" opening created at each corner of the tent by raising the aprons.

Observation: "Current tent pitching directions should be modified for operations in a tropical climate."

SOURCE: Headquarters, 88th Engineer Battalion (Depot)

ii. Tent Framing and Flooring.

Item: "Immediate need for tent framing and flooring.

Discussion: "The unit should have brought prefabricated tent framing and flooring kits for immediate construction and occupancy. This would have alleviated in part the dust, wind, and insect problem encountered in this climate. An attempt was made to obtain materials for these kits prior to leaving CONUS, but was not successful since only minimum support was afforded by the installation.

Observation: "Units deploying to RVN should investigage every possibility for acquiring items that will facilitate working in tents."

SOURCES: Headquarters, 18th Engineer Brigade
Headquarters, 168th Engineer Battalion (Construction)

jj. Loading Plan.

Item: "Unit loading plan is the key to an orderly move.

Discussion: "There is no standard format prescribed for the preparation of unit loading plans or what they should contain. With a good loading plan, packing and loading can be done in a systematic manner and nothing should be omitted.

Observation: "That criteria be established for the preparation and submission of a unit loading plan."

SOURCE: Headquarters, 54th Signal Battalion (Corps)

3. Base Camps.

a. Physical Security.

Item: "Protection from mortar attack.

Discussion: "Due to the shortage of protective materials (sand bags and heavy dunnage) available; most units on arrival have had to improvise protective bunkers. Two methods appear to be satisfactory: one being the use of conex containers covered with sand bags; and the second, deep narrow trenches. The latter can be constructed with a ditching machine in a short period of time to provide immediate protection and cen be improved as time permits."

Observation: "In preparing for the arrival of a new unit, the sponsor unit should provide for mortar protection for the sponsored unit as well as preparing a tentative perimeter defense plan."

SOURCE: Headquarters, 169th Ordnance Battalion

b. Laterite Areas.

Item: "Adequate drainage systems in laterite soil areas.

Discussion: "In the sandy coastal areas of Vietnam, the real estate acquired for military use is normally covered with laterite. This is done in order to provide a firm base for tentage and military construction. However, laterite does not absorb water readily. Laterite areas without drainage systems will flood easily and hold water during the monsoon season.

Observation: "Laterite covered areas should be well drained prior to utilizing them for military purposes.

SOURCE: Headquarters, 29th Quartermaster Group

c. Paulin Usage.

Item: "Paulin deterioration

Discussion: Due to high humidity and excessive rainfall, paulins used for outside warehousing and storage have extremely short life span. Mildew, rot and tears from repeated handling are primary factors. A life span of three months is not uncommon.

Observation: "Plastic film (Polyethelose FSC 9330-579-6489) is a satisfactory expendable protective covering for outside storage, if securely taped or tied down. Life span of this plastic covering is approximately two months. Items under protection are readily discernible for identification and inventory."

SOURCE: Headquarters, 32d Medical Depot

d. Care of Tentage.

Item: "Care of TOE tentage.

Discussion: "The heavy winds, severe rains and glaring sun cause rapid deterioration of TOE tentage. Tents erected utilizing only the provided poles deteriorate at a much more rapid rate than those framed. Unframed tents have needed replacement in as little as six months time.

Observation: "Steps should be taken to frame tentage, using available material to prolong their usage."

SOURCE: Headquarters, 864th Engineer Battalion (Construction)

e. Mess Hall Operations.

Item: "Refrigeration is needed in mess halls.

Discussion: "Refrigeration facilities for mess halls are essential. Sanitation and temperature conditions in Vietnam promote rapid spoilage of perishable foods.

Observation: "In the absence of standard refrigeration units, CONEX containers can be provided with sand bag insulation to provide iced cold storage facilities."

SOURCE: Headquarters, 54th Signal Battalion (Corps)

f. Mess Operations.

Item: "Keep salt and sugar dispensers moisture-free.

Discussion: "The high humidity in Vietnam causes salt and sugar dispensers to absorb a large amount of moisture and either lump badly or "clog up" and refuse to pour. This can be avoided by constructing a box with a single incandesent bulb in it in which the dispensers are stored while not in use. The box should be just large enough for all dispensers; may be open on top; and the inside should be painted white. The size bulb would depend on the size box; however, a 30 watt bulb should usually be adequate.

Observation: "Each mess hall should contain an apparatus of the nature described or at least some means of avoiding this annoying problem."

SOURCE: Headquarters, 70th Engineer Battalion (Combat)(Army)

g. Local Purchase of Fresh Vegetables and Ice.

Item: "Local purchase of fresh vegetables and ice.

Discussion: "With the buildup of troops, the demand for these items has increased proportionately, which has resulted in inflationary prices. An example of this is ice which has more than trippled in price the last year."

Observation: The U.S. Forces should set up their own ice plants, and storage facilities for fresh vegetables. Fresh produce to be procured and shipped from available source of supply."

SOURCE: Headquarters, United States Army Support Command

h. Mess.

Item: Items of limited supply.

Discussion: "The following items are in short supply in Vietnam.

Food:

(1) Salad dressing
(2) Salad oil
(3) Catsup
(4) Garlic

(5) Worcestershire sauce
(6) Hot sauce

Field Range M-1937:
(1) Generator
(2) Flame valve assembly

Other:
(1) Food container insulated (5 gal)
(2) Tableware (knives, forks and spoons)
(3) Trays
(4) Cups
(5) Bowls

Observation: "Units should assure that they have an adequate supply of the above memtioned items before departing CONUS. In addition, a 60 day supply of paper plates, cups and plastic knives, forks and spoons should be brought as yellow TAT to allow the unit time to establish a mess hall operation prior to the arrival of unit mess equipment (RED TAT). The use of paper plates and cups also reduces the possibility of food poisoning and disease."

SOURCE: Headquarters, 169th Ordnance Battalion

i. Sanitation.

Item: "Troops newly arrived in RVN are very susceptible to gastro-intestinal diseases.

Discussion: "For most troops,arrival in RVN is the first time that they have experienced field living conditions in an area of very low sanitary standards. As a result of poor individual sanitary habits and low resistance, a high incidence of gastro-intestinal disease occurs.

Observation: "The incidence of these diseases can be reduced by:

(1) "Establishment of field expedient hand washing facilities at urinals, latrines and mess halls. Provide NCO supervision to insure that troops wash their hands before entering the mess line.

(2) "Screen, disinfect, spray, and wash latrines, urinals and mess areas.

(3) "Provide NCO supervision to insure thorough sterilizing of mess gear before entering the mess line, and insure thorough cleaning of mess gear after eating.

(4) "Prohibit vehicles from driving in or near the mess and billeting areas to minimize the dust stirred up. Oil and/or wet down the areas around the mess hall.

(5) "Emphasize sanitation requirements in command information briefings. Post reminders on bulletin boards and in other prominent places."

SOURCE: Headquarters, 54th Signal Battalion (Corps)

j. Disposal of Human Waste.

Item: "Where sanitary conditions prohibit disposal by other means, human waste can be burned.

Discussion: "In some areas of RVN, such as the Camp McDermott troop area near Nha Trang, the water table is very close to the surface. The available area is highly restricted, long term occupancy is anticipated and no sewage disposal system is installed. Ordinary field pit latrines would rapidly contaminate the water table and water sources used both by U.S. and local national personnel.

Observation: "An interim means of disposal of human waste is to burn it in cut down 55 gallon drums mixed with diesel oil. With periodic stirring, very little residue results."

SOURCE: Headquarters, 54th Signal Battalion (Corps)

k. Field Sanitation.

Item: "Use of burn out latrines.

Discussion: "Due to the extreme heat and moisture, the most efficient odor free technique of keeping the latrine clean is burning out the excrement. This is accomplished by using fifty-five gallon drums cut in half. Each drum is removed daily and burned with diesel at the rear of the compound.

Observation: "This burn technique is generally agreed to be the most efficient; however, morale improved when Vietnamese were hired for this detail."

SOURCE: Headquarters, 11th Transportation Battalion (Terminal)

1. Laundry.

Item: "Inadequate local laundry service.

Discussion: "Military field laundry facilities were nonexistent and indigenous laundries were inadequate, especially during the monsoon season."

Observation: "Washing machines and water pumps had been brought to RVN as unit fund property. A battalion laundry facility was established, using a Herman-Nelson heater for drying during the monsoon season."

SOURCE: Headquarters, 54th Signal Battalion (Corps)

4. Training

a. Physical Conditioning.

Item: "Physical conditioning.

Discussion: "Combat operations, extreme heat, and difficult terrain place heavy physical demands on the soldier in Vietnam. There is no substitute for intensive physical conditioning."

Observations: "Troops in top physical condition upon leaving CONUS will become more easily acclimated to conditions in Vietnam."

SOURCE: Headquarters, 1st Infantry Division

b. Physical Training.

Item: "Necessity for and feasibility of PT aboard ship.

Discussion: "Units traveling from CONUS to an overseas area by ship are confronted with the problems of insuring that their personnel arrive at their destination in good physical condition, and are able to adequately perform their duties in hostile environments and intemperate climate. Because of the drastic effect which shipboard inactivity can have upon physical fitness, it is important that a physical training program be initiated aboard ship. Formal programs are dependent upon the weather and sea conditions.

(1) "Under suitable sea and weather conditions, adequate deck space is usually available for PT. Personnel can be broken down into groups of a size consistent with available space.

(2) "Stationary exercises can be performed in troop compartments (situps, pushups), in the aisles adjacent to bunks.

(3) "PT can be held in the mornings 15-50 minutes prior to call for chow. Since troops normally eat in shifts, they are automatically broken down into groups of manageable size.

Observation: "Physical training aboard ship is feasible and can be indispensable in building stamina against the fatigue, heat, disease and battle which may be encountered in destination country."

SOURCE: Headquarters, 525th Military Intelligence Group

c. Shipboard Training.

Item: "Necessity for and feasibility of shipboard training.

Discussion: "Units traveling to Vietnam by ship are given an excellent opportunity to increase their personnel's general knowledge of destination country through training. Too often, shipboard training is deemphasized or ignored entirely because of the inherent problems of inadequate space for classes, routine scheduling of daily activities (meal shifts, cleaning of troop compartments), lack of facilities for organizing the training program, and lack of training aids. With proper planning before departure from CONUS, however, many of these problems can be overcome.

(1) "The POI, Lesson Plan, and general scheduling of classes should be organized before embarkation.

(2) "Instructors should be selected, and their classes monitored, before boarding ship.

(3) "Training aids should be produced at the CONUS station prior to departure.

(4) "If possible, a representative from the training committee should inspect the ship several days prior to embarkation for available space, established ship routine, and possible areas for storage of classified training materials.

(5) "Early morning training and late evening training should seriously be considered, since these times do not conflict with shipboard duties and "plan of the day" schedules.

Observation: "Shipboard training is feasible even under adverse conditions and can do much to alleviate tedium and to prepare personnel for their arrival in destination country."

SOURCE: Headquarters, 525th Military Intelligence Group

d. Field Fortifications.

Item: "Field Fortification Training.

Discussion: "Units must be trained in the proper techniques of field fortifications. This includes perimeter bunkers and fortifications within sleeping areas."

Observation: "Training in field fortifications should be conducted prior to deployment to Vietnam."

SOURCE: Headquarters, 23d Artillery Group

e. Unit/Individual Training.

Item: "Specialized unit and/or individual training.

Discussion: "Artillery units being deployed to the Republic of Vietnam are faced with the necessity of constructing field fortifications upon arrival in country. Such units are required to construct gun pits and bunkers. Officers of heavy artillery units and/or units with heavy equipment, are frequently faced with the necessity of classifying bridges over which their equipment will pass.

Observation: "All individuals or units programmed for deployment to the Republic of Vietnam should receive specialised training in the construction of field fortifications. Officers being deployed with, or programmed for assignment to units which have heavy equipment, should receive some training on how to classify bridges."

SOURCE: Headquarters, 3d Battalion, 18th Artillery

f. Weapon Qualification.

Item: "Weapon Qualification.

Discussion: "Any man may be called upon to be armed with any unit weapon due to the heavy guard commitment and the variety of weapons required.

Observation: "That all personnel be qualified, or at least familiarized with every weapon assigned to the company."

SOURCE: Headquarters, 11th Transportation Battalion (Terminal)

g. Handling of Firearms and Ammunition.

Item: "Control of weapons and ammunition.

Discussion: "One of the im te problems commanders have encountered is the improper use and hand g of firearms and ammunition resulting in serious injury or death to our own personnel. Because personnel are new, not yet orientated, nervous, and in many cases have had limited experience with live ammunition, there have been injuries and deaths as a result of careless or accidental discharge of weapons. Strict SOP's to control the clearing of weapons, inserting loaded magazines in weapons, and loading of rounds into the chamber are necessary. SOP's should be adjusted to the location of the unit, its mission, and probable contact with enemy.

Observation: "Early enforcement of such SOP's will eliminate or reduce the number of accidental and self-inflicted wounds."

SOURCE: Headquarters, I Field Force Vietnam

h. Driver Orientation/Education Program.

Item: "Driver orientation/education program.

Discussion: "Personnel and equipment have been lost in traffic accidents. Most, if not all, of the vehicle accidents involving US troops could have been avoided by drivers observing ordinary driving precautions. Some of the causes of such accidents are a lack of caution and courtesy while passing cyclos and bicycles, excessive speed while following other vehicles and approaching intersection, drivers being unfamiliar with routes and traffic signs or driving while intoxicated, and speeding to avoid ambush. The possibility of injury or death to friendly or non-combatant personnel must be avoided.

Observation: "A driver orientation/education program early after arrival in country with follow through reminders to drivers emphasizing the hazards of driving in Vietnam is of the utmost importance."

SOURCE: Headquarters, I Field Force Vietnam

i. Vehicle Drivers.

Item: "Insufficiently trained drivers.

Discussion: "The accident rate in Vietnam is higher than normal due to the large number of bicycles using the city streets. Medical units, particularly ambulance companies, are receiving inexperienced or unqualified personnel as vehicle drivers. The units neither have the time, facilities or area to train these drivers.

Observation: "That a better drivers training program be initiated in CONUS and that only the best qualified drivers be assigned as replacements for vehicle drivers."

SOURCE: Headquarters, 58th Medical Battalion

j. Safety.

Item: "Safety.

Discussion: "Safety programs in CONUS are directed primarily toward traffic safety and range safety. These programs do little to prepare the soldier for living in an armed environment. After arrival in Vietnam, several serious accidents occurred due to the careless or thoughtless discharge of fire arms.

Observation: "CONUS safety programs should be expanded to include a thorough indoctrination on the safe handling of loaded weapons over extended periods of time."

SOURCE: Headquarters, 1st Brigade, 101st Airborne Division

k. Log Books.

Item: "Proper training of operators.

Discussion: "Inspections during this quarter revealed that many operators had received improper or insufficient training in how to maintain an equipment log book, as well as how to perform correct operator's maintenance on their equipment. It is believed that failure resulted in an unnecessary high deadline rate for equipment

in this battalion.

Observation: "Commanders should insure that new and inexperienced operators be given thorough training and instruction before permitting these men to operate a piece of equipment."

SOURCE: Headquarters, 39th Transportation Battalion

l. Convoy Requirements.

Item: "Route reconnaissance.

Discussion: "Units must conduct a thorough route reconnaissance with particular attention to width and weight limitations of bridges prior to moving a convoy.

Observation: "Route reconnaissance must be practiced during training."

SOURCE: Headquarters, 23d Artillery Group

m. Movement.

Item: "Security for motor movement.

Discussion: "Air cover and added security forces within the convoy are imperative to provide for protection against ambush.

Observation: "The status of training with respect to immediate action and convoy security should have great emphasis in training cycles."

SOURCE: Headquarters, 5th Battalion, 27th Artillery

n. Intelligence Training.

Item: "Intelligence training.

Discussion: "The individual soldier is a very poor source of information due to his lack of training in observation. It has been noted that the individual does not look for specific items such as dress, whether subject is armed or not, type of weapon if armed, or direction of travel.

Observation: "Individual soldiers must be taught to be more observant. Situations should be presented during advanced individual training, in unit training, and in Army Training Tests emphasizing reaction to casual sightings."

SOURCE: Headquarters, 41st Signal Battalion (Combat)

5. Civil Affairs/Civic Actions.

a. Coordination with MACV Advisors.

Item: "Coordination with Military Assistance Command, Vietnam Advisory channels must be effected in early planning stages.

Discussion: "US Forces are operating in conjunction with and at the request of a friendly government. The daily contacts with the host government's military and civil officials are maintained for the most part by the MACV Advisory Detachments. MACV Advisors are conversant with the personnel and procedures involved in Vietnamese military operations and civil administration. Coordination with the MACV Advisory elements early in the planning stage increases efficiency of the joint US - GVN operations and projects.

Observation: "Make maximum use of MACV Advisory resources."

SOURCE: Headquarters, 1st Infantry Division

b. VC Rice Caches.

Item: "VC rice caches, particularly the larger ones of 20 to 100 tons or more, are often located in inaccessible areas, and are extremely difficult to extract.

Discussion: "One solution, which is sometimes possible, is to arrange with the District Chief or Province Chief before an operation begins to have 200 to 300 porters available and ready to enter any area where rice caches may be found, under the protection of US Forces. Evacuation by helicopters has sometimes been accomplished, but the suitability of employing them to remove large quantities of rice is questionable.

Observation: "Plans should provide for the evacuation of rice caches whenever possible."

SOURCE: Headquarters, 1st Brigade, 101st Airborne Division

e. Price Control.

Item: "Prices of goods sold on the local economy tend to become inflationary with the arrival of American troops.

Discussion: "Prices can be controlled in on-base or contonment area shops by concession agreements, but downtown local merchants can charge

to the maximum amount obtainable. Since province officials disclaim any power to enforce price ceilings on goods sold locally, the area command itself must establish a price control program to check the growth of local inflation. Under such a program, servicemen stationed in the area can be advised to report any upsurge of prices in local establishments. Local establishments which consistently refuse to maintain fair price levels can be placed 'off limits' to American military personnel. A fair price guide published by the area command can inform both the serviceman and the local merchants of just what the fair price level is."

Observation: "Area commanders in Vietnam must initiate and enforce price control programs in order to curb local inflation."

SOURCE: Headquarters, 29th Quartermaster Group

6. Military Intelligence.

a. Aliens.

Item: "Security clearances for aliens."

Discussion: "Granting security clearance to aliens requires far more extensive investigations with more demanding criteria than does granting clearances to citizens. Certain of the requirements can only be fulfilled in the United States."

Observation: "If aliens are to occupy sensitive positions or positions within sensitive units, they must be granted security clearances prior to their leaving the United States. Granting any degree of clearance requires a background investigation which should be completed prior to their departure."

SOURCE: Headquarters, 525th Military Intelligence Group

b. Intelligence Exploitation of Psychological Operations.

Item: "Psychological operations and intelligence efforts must be coordinated."

Discussion: "Close coordination is required between military intelligence agencies and psychological operations detachments so that factors bearing on enemy morale, as determined by interrogations, may be rapidly exploited."

Observation: "Intelligence/Psy Ops coordination should be established in the planning phase of operations."

SOURCE: Headquarters, 1st Infantry Division

7. Counterinsurgency Operations.

a. Counterinsurgency Operations.

Item: "G-5, S-5 Staff".

Discussion: "Counterinsurgency operations are as much political and economic as they are military. When large numbers of troops must be committed in a counterinsurgency situation the economic and political situation has normally deteriorated to the extent that civilian agencies cannot cope with the problems. Many of these problems then, in part at least, become the responsibility of the military. Units have arrived in Vietnam without, or with understrength, civil affairs staff.

Observation: "It is essential that G5 or S5 staffs become a part of all military units from Field Army to battalions at the beginning of operations and that personnel with broad training in political science or counterinsurgency fill the positions at the division or higher level. At regiment, brigade, and battalion level, more limited training or experience in civic action will suffice."

SOURCE: Headquarters, I Field Force Vietnam

8. Psychological Operations.

a. Lack of Troop Awareness of Psychological Operations.

Item: "Overcoming lack of troop awareness of current psychological operations.

Discussion: "Aerial loudspeakers are being used to exploit psychological opportunities that may be developed during tactical operations, such as isolated groups of refugees or potential ralliers. For maximum effectiveness, friendly troop units must be aware of the purpose of the broadcast and of any part they may be expected to play. Dissemination of such information through command channels is difficult and time consuming. A solution is to broadcast a translation of the

appeal in the language of the friendly troops, English or Korean, explaining at the same time what is expected of ground units. A broadcast of this type is particularly useful when the appeal consists of directions on how to rally or surrender and that if special considerations are involved, it insures that the ground troops understand these as well. This practice also has the added benefit of providing an on-the-ground check of loudspeaker effectiveness and a chance to determine if any offset in flight path is required."

Observation: "When tactical and security conditions permit, this technique should be used."

SOURCE: Headquarters, I Field Force Vietnam

b. Psychological Operation Reaction Time.

Item: "Psychological operations reaction time to meet operational requirements.

Discussion: "Production and/or printing time involved in preparation of leaflets, posters and broadcast tapes may preclude their use when needed. The development, preparation, stockage and cataloguing of leaflets, posters and broadcast tapes, designed to meet specific situations indigenous to the area of operations, enables operational requirements to be met on a timely basis.

Observation: "Catalogs of available material must be prepared and issued to using units with basic loads of posters, leaflets and broadcast tapes positioned to meet operational needs."

SOURCE: Headquarters, 1st Infantry Division

c. Psychological Operations and Local Customs.

Item: "Local customs must be considered in preparing psychological operations material.

Discussion: "To preclude unintended adverse feedback from tapes, posters or leaflets, consideration must be given to the nature of the material used in relation to the customs and traditions of the operational area.

Observation: "Coordinate subject matter with indigenous authorities

prior to use and/or publication."

SOURCE: Headquarters, 1st Infantry Division

d. Psychological Operations/Fire Support Coordination.

Item: "Coordination with fire support element must be effected by psychological operations teams.

Discussion: "Broadcast mission and leaflet flights require the same coordination with tactical fire support elements as do any other forms of aerial flights in or over the operational area.

Observation: "Include coordination with fire support element on psychological operations checklist for broadcast missions and leaflet flights."

SOURCE: Headquarters, 1st Infantry Division

9. Personnel & Administration.

a. Maintenance of Unit Strength.

Item: "Programming for anticipated personnel losses.

Discussion: "From significant battle and non-battle personnel losses during the initial commitment of the 1st Air Cav Div, it was learned that plans for the replacement of these losses must be prepared well in advance. If provisions are not made to compensate for these losses before they occur, units will continually engage in operations at less than 100% present for duty. Therefore, it is necessary that requisitions be based on 110% of authorized strength in order to attain and maintain present for duty strength of 100%.

Observation: "Continous monitoring of unit strength is necessary in order to maintain a 100% present for duty strength."

SOURCE: Headquarters, I Field Force Vietnam

b. Personnel.

Item: "Interchange of personnel.

Discussion: "When a unit follows a "sister" unit into a command, there should be an immediate exchange of personnel to preclude a 60 to 80 percent loss in any one unit upon DEROS.

Observation: "This can and should be worked out with the least practicable delay."

SOURCE: Headquarters, 35th Engineer Group (Construction)

c. Finance:

Item: "Deployment of finance personnel and records.

Discussion: "The shipment of finance personnel and records by surface transportation during deployment of the division to Vietnam resulted in numerous personnel receiving late pay. This problem could have been solved if finance personnel and records had been air lifted. This procedure will permit the finance office to retain control over its personnel and records for a longer period of time, allowing finance services to be maintained until departure of troops and immediately reinitiated upon their arrival at destination.

Observation: "Air lift of finance personnel and records for units deploying to Vietnam will result in uninterupted finance services."

SOURCE: Headquarters, 1st Infantry Division

d. Military Pay Vouchers.

Item: "Effect of dampness on military pay vouchers.

Discussion: "The DA Form 2139 (Military Pay Voucher) serves as a medium for payment of pay and allowances to Army personnel. It is an individual sheet, continuous, manifold form in five copies. The paper is treated with chemicals and requires no carbon. If the pay voucher becomes damp the chemical reaction stops and the entries fade or disappear. This effect is especially prevalent in Vietnam due to high humidity.

Observation: "Vouchers should be stored in waterproof containers with silica gel, if available; vouchers must be completely dry before preparation."

SOURCE: Headquarters, I Field Force Vietnam

e. General Courts-Martial Jurisdiction.

Item: "General Courts-Martial Jurisdiction and facilities must be sufficiently flexible to allow cases to be tried in an area geographically proximate to the scene of the crime.

Discussion: "Transportation and communication barriers render the trial of cases nearly impossible — particularly, where civilian witnesses are involved — unless the trial can be conducted in the immediate geographical area of the crime. It must be remembered that the average Vietnamese villager can neither read, write, nor tell time. Transporting these people away from their villages presents insurmountable problems.

Observation: "Work toward taking the court to the case, rather than attempting to transport the case to a distant court."

SOURCE: Headquarters I Field Force Vietnam

f. Incoming Personnel.

Item: "Orientation of incoming personnel.

Discussion: "Increasing number of low ranking (E-3) replacement personnel (MOS 97B) are being sent to Vietnam who have had no experience in CI operations and who have had hardly any prior orientation on the political, religious and geographical background of this country. This situation necessitates the utilization of valuable time and instructor personnel, who are normally involved in operational duties, to conduct a continuous, intensive orientation and training program for a length of approximately two weeks per group. Some of the recommended subjects include the following:

(1) "Political, Religious and Geographical Background of Vietnam.

(a) "Vietnam since 1954.

(b) "Former Leaders.

(c) "Current Leaders.

(d) "Religious Sects and Their Leaders.

(e) "Geography of Vietnam.

(f) "Important Ethnic Groups.

(2) "Operational subjects:

(a) "Technology.

(b) "CI interviews and interrogation.

(c) "Report writing.

(d) "Source recruitment; spotting, assessing and recruiting.

(e) "Source handling.

(f) "Source control.

(g) "Debriefing of sources.

(h) "Aggressive CI operations.

(i) "Operational plans.

(j) "Proper methods of effecting liaison with VN agencies.

(k) "Personality characteristics of VN people in relation to CI operations.

Observation: "While most of the operational subjects should be conducted locally since the operations are geared to meet local conditions, it is believed that the political, religious, and geographical background orientation aspect should be accomplished prior to the replacements' being shipped overseas."

SOURCE: Headquarters, 525th Military Intelligence Group

g. Troop Orientation.

Item: "Troop orientation.

Discussion: "From observing the conduct of the young servicemen who are overseas for the first time, in a country with a relatively low standard of living, it becomes apparent that not enough guidance is given them on what to expect and how to conduct themselves in foreign circumstances.

Observation: "More attention should be given to psychologically preparing the servicemen for the conditions they will encounter overseas; specifically:"

(1) "Native sensitivities to foreign troops.

(2) "Diseases and health menaces.

(3) "Native customs.

(4) "Difference in economic conditions; e.g., An 18-year-old American PFC makes as much salary as a Vietnamese Army Captain."

SOURCE: Headquarters, US Army Support Command, Nha Trang

APPENDIX I

"TACTICAL TIPS"

The "Tactical Tips" were published by the Commanding General of Field Force Vietnam in December 1965. This headquarters is now designated Headquarters, I Field Force Vietnam. The headquarters was and is still located at Nha Trang and has operational control over the major US Army combat units operating in the II Corps Tactical Zone.

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DEPARTMENT OF THE ARMY
HEADQUARTERS, FIELD FORCE VIETNAM
Office of the Commanding General
APO US Forces 96240

AVF-CG-TNG

17 December 1965

SUBJECT: Tactical Tips

TO: SEE DISTRIBUTION

1. As an assist to all unit commanders the attached list of tactical tips has been developed for use in operations against the VC.

2. While the points brought out may not solve all problems in the field, if more attention is paid to what can be done by the unit commander on the ground, our successes will be stimulated in every direction.

/s/Stanley R. Larsen
/t/STANLEY R. LARSEN
Major General, USA
Commanding

1 Incl
as

DISTRIBUTION:
10 - CG, 1st Air Cav Div
30 - DSA II Corps
10 - CG ROK Capital Div
5 - CG ROK Marine Bde
5 - CO 1/101st Abn Div

THIS PAGE NOT USED

TACTICAL TIPS

1. Intelligence. Must be timely, reliable, and detailed. Stress importance of who, what, when, where, how many to troops for reporting. Speed is essential in acting on intelligence.

2. Operations Planning. Plan for an adequate force for the task to be accomplished. Both maneuver and fire support elements of sufficient strength are required for any operation. Provide an adequate reserve. Missions of subordinate units must contribute to the overall force mission. The initial force employed must be large enough to accomplish all phases of the operations.

3. Coordination. All interested and participating agencies must be knowledgeable of an operation and the extent of their mission. Problem areas must be resolved prior to the start of an operation.

4. Communications. An effective system of communications, to include radio, wire, audio, and visual is vital to the success of an operation. Communication with all elements of a force is required. Without communications there is no control. Multiple means of communication is desirable.

5. Fire Support. All available combat support means must be given maximum utilization. Special attention must be directed to fire support planning. The VC will take advantage of any discernable inadequacy in fire support efforts.

6. Artillery Support Planning. Plan artillery support for all operations. Observers on the ground with units must be supplemented by airborne observers. All elements to be supported must have the fire plan, call signs and frequencies, and current authentication system. Artillery must not be relied on as a substitute for organic weapons and maneuver forces. Plan support for all deployed units, especially when an enemy ambush attempt is anticipated. Fire support coordination must begin at the lowest level. Use "Flack Suppression" fire against VC ground fire directed at friendly aircraft.

7. Combat Reconnaissance Operations. Deception must be employed when conducting aerial reconnaissance. Overfly other areas as well as the objective area. Air reconnaissance is not a substitute for ground reconnaissance. Combat reconnaissance using small, highly trained units are effective against squad or smaller sized units in suspect areas, and are capable of collecting accurate and up to date information. Generally it is comprised of 20 to 24 men armed with lightweight automatic weapons. It is not capable of conducting sustained operations and should complete its task on the ground in 15 minutes or less.

8. Landing Zones. Select primary and alternate LZs. Repeated reconnaissance of primary landing zones may give the VC a premature advantage and allow time to plan, prepare, and execute an ambush at the critical time and place. As many leaders as possible should be on the initial flights to minimize flights required.

9. Terrain. Utilize the terrain. Take advantage of cover and concealment for deploying troops. Stay off trails, roads, and stream beds. When defending, select positions affording fields of fire and observation, or which will canalize the enemy in approaching the friendly position.

10. Maneuver. Maintain mobility and flexibility of maneuver. The situation may dictate changes. Unwarranted deviation from the plan will result in a lack of sufficient force at the point of decision. Control of forces must be maintained at all times.

11. Attacks. Use fire and maneuver; advance under cover of supporting fires. The assault must be violently executed. Momentum of the attack must be maintained.

12. Saturation Patrolling. Conduct saturation patrolling in areas under control of the VC to locate him. Area saturation tactics deny the VC free access to all areas within the area of operation. Conduct frequent and persistent night operations. Patrolling simultaneously on many axes in a large area results in a greater number of meeting engagements with the VC. Perform concurrent Psy War/Civic Action missions.

13. Search and Destroy Missions. Search and destroy missions require employment of flexible control measures such as zones of action and phase lines. The objective must be to gain and maintain contact with and destroy the enemy. Units should orient on the enemy, not on terrain objectives.

14. Eagle Flights. In addition to normal methods of employment an eagle force can be used to reinforce air strikes by landing immediately following completion of an airstrike to engage surviving elements of an enemy force.

15. Ambushes. Conduct ambush operations at night as well as during daylight. Conduct a detailed rehearsal prior to occupying the position. Each individual must thoroughly understand his task. Move to the ambush site by concealed routes, or move after dark. Spring the ambush quickly and violently; pursue escaping VC with fire.

16. Night Operations. Conduct frequent operations during darkness. Stay behind patrols and ambushes operating at night hinder VC movement.

Plan artillery fires on known and suspected VC assembly areas and routes of movement. Plan aerial infrared photography and airborne radar surveillance over suspect areas.

17. Prevention of Ambushes. A unit moving tactically from one point to another can not move both rapidly and maintain proper security at the same time. The commander must decide which he wants. Of the choices it should be only the exception when the situation demands rapidity of movement at the price of security. All around security on the move. Security elements must be posted to the front, on both flanks, and to the rear. Security elements must check every area within small arms range of the main force. A communications system must be provided. Assume that no area outside a perimeter or compound is secure. (See Par 6)

18. Counterambush. Reaction to ambushes must be swift and violent in nature employing automatic weapons and grenades, and rapid assault of the ambush position. Each unit must have a counter ambush plan understood by all. Personnel must be constantly alert and ready to fight. Weapons must be in the soldiers' hands. Sights must be set. Impedimenta must not be suspended from weapons. Plan and use artillery support.

19. Artillery Positions. VC operational plans take into account range and locations as well as battery response time. Frequent changes of position will add to the effectiveness of artillery and the disruption of VC plans. "Hip Shoots" add surprise to artillery target area coverage.

20. Defense. Plan for all around defense. Do not disclose automatic weapons positions by firing during sporadic sniper fire. Use ambush patrols and early warning devices to cover avenues of approach into the perimeter. Be especially alert during periods of limited visibility.

21. Night Halts. Halt on the most defensible terrain available. Establish a tight perimeter which means an all around defense. Dispose automatic weapons and grenade launchers to cover avenues of approach to the perimeter. Set out trip flares and anti-personnel mines. Schedule periodic illumination of the areas outside the perimeter.

22. Marking Ground Locations. Colored smoke should not be used to establish ground locations for pilot identification unless contact with the enemy has been made. Use colored panels when the situation permits. In thick jungle the aircraft can fly a criss-cross pattern over the jungle area and be given a radio signal when directly overhead.

23. Convoys. No route is 100% safe. Convoy protection depends upon common sense measures for security. Convoy operations must be thoroughly coordinated to include intelligence, communications, air and artillery support, route security forces, and alert reaction forces. One agency

should be responsible for all coordination. Air cover (AIRCAP) reduces the likelihood of ambush.

24. Medical Evacuation. Casualty evacuation must be expedited. Insure that the evacuation system for civilians, ARVN, and Free World personnel is understood by all medical personnel.

25. Command and Control. Brigades and Regimental operations will be conducted under the personal control of the commander. An Airborne Command Post will be made available for use in all Regimental and Brigade sized operations and may also be made available to battalion commanders. when their companies are operating separately over extended distances.

26. Counter Sniper Actions. Commanders moving units through this jungle areas will employ reconnaissance by fire plus artillery and air strikes to disrupt enemy forces occupying defensive or ambush positions and to dislodge snipers from trees.

27. Air Cap. Commanders will call for Air Cap over all operations other than routine clearing and small unit actions in the vicinity of base camps. This applies equally to armed helicopters which will be rotated over units in action.

SOURCE: Headquarters, Field Force Vietnam

APPENDIX II

"TACTICAL TIPS - DO'S AND DONT'S"

These "Tactical Tips - Do's and Dont's" were published by Headquarters, Field Force Vietnam. They apply to commanders as well as to individuals and cover almost the entire spectrum of counterguerrilla warfare. They are about as concise a text book on workable doctrine that has been produced in Vietnam to date.

The specific areas included in this document include

Planning Operations

Operations in General

Logistics

Convoys

Ambushes

Counterambush

Search and Destroy

Heliborne Operations

Patrols

Defense

Booby Traps

Base Camp

Intelligence

Artillery

General Cultural

These "Tactical Tips - Do's and Dont's" lend themselves to being copied into the notebooks of the junior leader.

Planning Operations

Do's

Plan in detail.

Plan for the use of all available fire support means - organic weapons, artillery, Army armed helicopters, tactical air and Naval gunfire.

Plan for air space control in the operational area.

Plan for adequate communications to include any required ground or airborne radio relay.

Plan operations to allow sufficient time for a thorough search of the operational area and the destruction of enemy installations.

Plan for reconnaissance (aerial, ground and photographic) from the point of departure thru the operational area to the return release point.

Plan for reserve forces for all operations.

Plan for coordination with local authorities and arrange to have their representatives accompany the force when possible.

Plan for security forces to cover areas vacated by operational forces.

Plan for and use every available intelligence source in all operations.

Plan for the exchange of SOI's between Army ground and aviation units and with Air Force operational units.

Plan for adequate fire control observers - Artillery Forward Observers, Forward Air Controllers and Naval Gunfire Observers.

Plan for aerial command and control posts.

Plan for adequate air to ground recognition signals in every operation.

Plan for helicopter refueling and rearming in operations requiring their use.

Plan for night illumination for all operations.

Plan for the use of Claymore mines in ambushes and in defense.

Plan overhead cover in defensive positions whenever possible.

Plan to conduct rehearsals of operations whenever possible.

Plan for rotation of units conducting routine operations to eliminate complacency and boredom.

Plan for succession of command in convoy, patrol and similar operations.

Plan for resupply and evacuation to include aerial means for each.

Plan supply brevity codes in case it becomes necessary to transmit administrative traffic over command communications means.

Plan for resupply by Low Level Extraction (Lolex) or heavy drop when operating over 40 miles from your primary supply base and helicopters are not available or when JP-4 (Fuel for the UH-1 Helicopter) is in short supply.

Plan for the use of psychological warfare support whenever possible.

Plan for civic action whenever possible.

Include representatives from all of the supporting forces in the formulation of plans.

Plan for the utilization of stay behind patrols.

Plan and coordinate with ARVN for the extraction of captured food and weapons caches.

Plan for the engineers to prepare LZs for resupply and air-evac.

Plan for troops to arrive at LZs immediately after preparation fires or air strikes.

Plan to use National Police.

Plan with ARVN for the safety and relocation of refugees.

Plan for the immediate interrogation of captured VC and VCS.

Plan to have interpreters with each company size unit.

Plan for the necessary materials and devices to mark friendly positions during hours of darkness as an aid for night close air support.

Operations General

Do's

Move through jungles on multipe columns, with all-around security and using connecting files.

Move on concealed routes whenever possible.

Practice land navigation at all times - use the compass, pacing and terrain orientation.

Use hand and arm or other silent signal means whenever possible.

Fire initial rounds low, a ricochet is better than an overshot miss.

Practice fire discipline.

Keep weapons immediately available for use.

Treat any stranger as a possible enemy.

Avoid developing patterns in any and all operations. The VC take advantage of any predictable pattern of operation.

Vary smoke signal meanings to deny the enemy the ability to interpret.

Maintain enemy contact once it is gained.

Test fire weapons before each operation.

Carry the bayonet on all operations - it makes a good mine probe.

Consider troop combat efficiency over troop comfort.

Be alert to dead foliage, it may be old camouflage over booby traps, defensive positions or wound producing positions.

Protect sensitive equipment from the elements and rough use.

Stress light and noise discipline at night.

Check enemy casualties carefully to insure any Viet Cong feigning death are captured.

Maintain contact with the VC, once established.

Use artillery to assist in securing front, flanks and rear of columns.

Remember, PAVN troops frequently attempt to confuse US troops during battle at night by yelling "FRIENDLY FORCES".

Assign soldiers to observe trees for snipers.

Dont's

Do not call for helicopter medical evacuation until the casualty is near the landing zone.

Do not travel alone at any time - use the 'buddy' system.

Do not trust children at any time. They may be VC agents.

Do not panic - wait until the VC closes within effective range of your position to insure killing him.

Do not consider any route or area inaccessible to the enemy.

Do not listen to, or pass on, rumors.

Do not move on roads, trails or creekbeds unless they have been checked out and secured.

Do not leave anything behind when on an operation - the VC will use anything he can get against you. Refuse can provide the enemy intelligence on units size and the formations or positions used.

Do not use automatic weapons to counter enemy harassing fires - he uses these fires to develop troop and weapons dispositions.

Do not use the same route to and from operations.

Do not use radios excessively. Keying the handset is an excellent method of acknowledging messages.

Do not rush operations or movements. Thoroughness and security should never be sacrificed.

Do not break seals on ammunition until you are ready to use it.

Do not overclassify or use an unnecessarily high precedence on electrically transmitted messages.

Do not leave mines and flares in abandoned positions - the VC will salvage them for use against you.

Do not use captured weapons or ammunition because they are often booby trapped or rigged to malfunction.

Do not leave vehicles or equipment unattended at anytime.

Do not abuse equipment - your life may depend on it.

Do not mistreat prisoners of war. Remember, harsh and cruel treatment is inappropriate.

Do not let PAVN units employ "close embrace" tactics to prevent our use of supporting fires.

Logistics

Do's

Be sure grenade ignitors are screwed in tight and safety pins are properly crimped.

Be sure to tape grenade handles when not actively engaged, to prevent accidental firing.

Carry adequate supply of illumination ammunition when operating at night.

Carry extra demolitions on all operations, or have plans to bring them in, on call, by helicopter.

Carry files or sharpening stones for machettes and axes when operating in jungle.

Police the battle area and destroy everything left behind (A rundown battery can still fire a booby trap!).

Protect your personal property.

When using vehicles be sure they are equipped with tow cables and chains.

Establish an admin/log net as soon as possible.

Give resupply and air evacuation helicopter personnel ground unit call signs and frequencies to expedite their action.

Effect resupply prior to darkness whenever possible.

Carry machetes,, axes and saws on all operations.

When in base camp off load basic loads and vehicle sandbags to lengthen the life of vehicle suspension system.

Treat all water before use.

Roll sleeves down at night, use mosquito nets, and use insect repellent to cut down malaria incidence.

Prestock culverts, PSB and timber for tactical purposes.

Take only essential supplies and equipment on operations.

Coordinate with the Air Force when using intratheater airlift so that loading will be based on actual aircraft capacity.

Pre-palatize supplies to reduce resupply time..

Coordinate with the helicopter support unit to insure they have adequate slings for use in resupply.

Check all sling loads to be sure they are properly configured and prepared for lift by supporting airmobile units.

Plan for extra WP ammunition to be used for marking targets.

Convoys

Do's

Have a single overall commander for each operation.

Provide a succession of command to cover possible battle losses.

Plan supporting fires along the entire route.

Always have AIR CAP.

Provide an alert force to extricate any portion of the convoy attacked.

Provide escorts in addition to reaction forces.

Keep movement times and dates secret until the last possible moment.

Rehearse immediate action to be taken in case of attack.

Check equipment readiness before moving out.

Coordinate with all agencies, area forces and commands thru which the convoy will move.

Have effective communications with a back up at all times.

Avoid identifying command and control vehicles.

Face riding personnel outward to permit immediate return of fire if attacked and leave the vehicle tail gate open to permit easy exit.

Have all personnel carry weapons at the ready at all times.

Sandbag vehicle floors.

Provide and maintain vehicle intervals at all times (minimum 100 meters).

Consider any portion of the route as a potential ambush site.

Avoid routine and repetition.

Treat all strangers as possible enemy.

If fired on: Immediately return fire, attempt to drive out of the killing zone, attack the ambush force as soon as possible.

Use march serials to improve convoy control.

Provide the convoy commander with a helicopter.

Provide for a sufficient Infantry force. The ability to engage in dismounted action off the road is a necessity.

Issue convoy route maps showing enemy situation to each vehicle commander.

Have maintenance personnel accompanying convoy.

Dont's

Do not emplace supporting weapons in the same location each day on succeeding convoys.

Do not relax at anytime - the VC may allow portions of or whole convoys to pass in order to gain complete surprise.

Do not allow civilians (including children) to approach or get on any vehicle.

Do not leave vehicles or equipment unguarded at anytime.

Do not allow a broken down vehicle to be left unprotected.

Do not over load vehicles.

Ambushes

Do's

Have a single commander.

Vary the ambush formation to fit the terrain and to avoid being stereotyped.

Provide sufficient firepower to cover the killing zone and escape routes.

Insure every man knows his job.

Control noise, lights and smoking at all times to prevent detection.

Select a site where enemy chances of escape are minimal.

Mine and/or booby trap escape routes.

Rehearse the ambush whenever possible (Sand tables can be used effectively).

Exploit surprise when engaging the VC.

Use simple, easily understood signals.

Prepare to react immediately to VC counterambush action.

Exploit and search immediately after springing the trap. Bring back all weapons, documents, clothing and equipment captured.

Fire low, a ricochet is better than a miss.

Plan night ambushes to cover normal VC movement periods and routes.

Provide illumination for night ambushes after the trap is sprung.

Use stay behind ambushes to trap and destroy the VC when leaving an operational area.

Keep civilians (including children) from observing movement to, or emplacement of, the ambush.

Develop a simple pocket card check list for all to use to insure the ambush is complete.

Use all available firepower.

Close with and destroy the enemy as rapidly as possible.

Dont's

Do not spring the trap too early.

Do not use the same site repeatedly.

Do not use radios for voice transmissions until the ambush has been sprung. Predetermined codes for keying of the set can be used to keep silence.

Counterambush

Do's

Make a detailed reconnaissance by all available means before beginning any operation.

Plan fires on all suspect areas.

Provide front, flank, and rear security at all times.

Provide a succession of command in case the commander is trapped in the killing zone.

Provide a reaction force to flank or cut off the ambushing force.

Practice immediate action drills to make reaction instinctive.

Use stealth to conceal time and routes of movements.

Control noise so as not to compromise your approach.

Have security forces perform detailed check-outs of all possible ambush sites.

Maintain continuous communication with all elements at all times.

Vary formations and time of movement.

Rotate units on local security missions to increase alertness.

Report suspect areas as they are approached.

Immediately return fire and attack the ambush forces.

Use white phosphorus grenades and offensive grenades against the killing party to inflict VC casualties and screen your assault.

Continue to fire, even after the VC stops, to prevent his recovering weapons, bodies and escaping.

Clear the entire ambush site once the ambush is overcome.

Examine all intelligence data.

Request air cover. Maintain an AIR CAP.

Always have a forward observer.

Make detailed fire support plan.

Sandbag vehicles.

Keep motor columns widely dispersed.

Use dogs if available.

Keep off roads, trails and stream beds.

Watch for mines and booby traps.

Flank VC and attack.

Ambush VC withdrawal.

Expect an ambush.

Dont's

Do not move out to assist another unit under attack without first making a complete reconnaissance (the VC often conduct an attack so as to be able to ambush relief forces).

Do not consider any area to be free of ambush - the VC use the unorthodox as normal.

Do not consider normal civilian activity in an area to be an indicator that it is clear - VC use civilians in cover and deception.

Do not announce any movement or operation until the last possible moment.

Do not be baited into careless pursuit of the VC.

Do not bunch up at anytime.

Do not try to take cover in the killing zone.

Search and Destroy

Do's

Plan fires to cover the entire area of operations.

Have air reconnaissance over the objective and routes thereto, to limit the enemy surprising you. However, care must be used not to reveal your intentions.

Have a rapid reaction force available to block enemy withdrawal, provide a covering force and to mop up.

Use concealed routes or darkness to conceal your approach.

Withhold scheduled fires to the last moment so as not to reveal your intentions.

Be alert for snipers in unorthodox locations such as dung piles, gardens, haystacks, wells, etc.

Commit only the minimum force necessary to destroy snipers.

Use some form of encirclement when villages are encountered.

When possible, use villagers to precede you into villages — they will avoid mines, booby traps and obstacles.

Avoid being canalized by fences, hedges, punji traps, etc.

Be alert for cleverly comouflaged tunnels, caves and bunkers.

Provide for demolitions to accomplish tunnel destruction.

Question local individuals out of sight and hearing of groups so they will talk without fear of reprisal.

Leave stay behind ambush patrols to ambush returning VC and those hidden underground and undetected.

Search every possible nook and cranny for booby traps, weapons and possible intelligence information.

Be alert for fleeing VC after isolated explosions. The VC often eject a grenade thru a hole in a tunnel to cover their escape by another passage.

When it becomes necessary to deliberately destroy a Vietnamese village, attempt to secure written permission of the Province, District or Sector Chief to have the village burned. After receiving this permission, have either the person giving permission or his representatives (i.e., a Vietnamese national) actually set fire to the village.

Maintain contact with the VC.

Treat civilians in operational areas with caution, but also with respect.

Carry demolitions for the destruction of bunkers, tunnels and booby traps.

Be prepared for difficult movement when searching areas which have been subjected to B52 strikes.

Dont's

Do not relax at any time, especially on return from an operation.

Do not allow captured civilians and VC to mix.

Do not separate small children from their mothers.

Do not throw grenades into mud or wooden buildings without having adequate cover.

Heliborne Operations

Do's

Make detailed reconnaissance of all landing zones and objective areas in coordination with the airlift element.

Plan to use Army Air - Air Force and Artillery to seal off the objective area.

Provide for a reaction force.

Consider weather in all planning.

Provide back-up spare aircraft to cover aborts.

Plan suppressive fires on the landing zone to be executed at the last possible moment.

When multiple lifts to the same LZ's are used, shift suppressive fires farther out or on avenues of approach for the landing of succeeding lifts.

Plan for medical evacuation to include providing pilots of medical evacuation helicopters with unit frequencies to expedite their action.

Provide for armed helicopter escort. Consider aircraft refueling and rearming time when planning an operation.

When possible, stage operations from an air facility to expedite refueling, loading and rearming of aircraft.

Provide different routes for multiple lifts to the same LZ.

Select multiple landing zones when possible and use a deception plan to deny the enemy knowing the primary zone.

Select landing zones which facilitate rapid, decisive maneuver and prevent the VC from reacting.

Provide an inflight briefing for passengers being transported so they are oriented on landing.

Plan for an airborne CP until control can be passed to the ground commander.

Use air support to interdict routes on the rear and flanks of the LZ.

Move troops intoLZ's immediately after preparation fires and air strikes.

Select LZ's close enough to the objective to permit troop arrival before the VC can react.

Have the leaders of the assault group oriented during final approach to the LZ.

Dont's

Do not dispatch helicopters in less than pairs.

Do not disembark from a helicopter until it is firmly on the ground.

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Patrols

Do's

Coordinate with ARVN, Popular/Regional Forces and Special Forces, as appropriate, prior to executing any operation.

Plan for automatic weapons to be in the lead element.

Plan and react to cut off enemy escape routes.

Have a planned succession of command.

Plan in advance for medical evacuation.

Check all personnel for physical condition and proper equipment before moving out.

Make initial moves from camps under cover of darkness or by concealed routes.

When possible move on multiple and mutually supporting routes.

Be alert for ambushes.

Be prepared for sudden meeting engagements.

Move with stealth.

Maintain front, flank and rear security.

Be alert for punji traps, mines and booby traps.

Report enemy contact by the fastest available means.

Maintain contact with the enemy, once you have it.

Use your own combat support means before calling for outside assistance.

Develop and use silent signals.

Carry only essential supplies and equipment.

Occupy clandestine patrol assembly areas after dark to avoid detection.

Begin movement before daylight and continue well after dark to intercept the VC when he is moving.

During extended operations in the jungle consider taking only one 81mm mortar per rifle company and using other mortar personnel to carry extra ammunition. Include illumination rounds when the patrol will be out overnight.

Establish a perimeter at night and put out trip flares.

Remove all trip flares at first light.

When possible, set up ambush patrols during night halts.

Let an individual enemy penetrate the patrol base, then kill him by silent means to avoid giving away your position. The VC often send out scouts to locate positions, then attack in force, those detected.

Dont's

Do not wear armor vests on prolonged ground operations.

Do not bunch up - present as small a target as possible.

Do not talk, laugh, smoke or use lights.

Do not travel exclusively on roads and trails.

Do not out-maneuver your security forces.

Do not allow movement in the patrol base at night.

Defense

Do's

Develop all-round security.

Always place ambush patrols on likely avenues of approach outside the perimeter and increase the number during hours of darkness.

Provide combat patrols and listening posts beyond the perimeter.

Plan the use of all available support fires.

Use wire entanglements around the entire position when wire is available and time permits.

Intergrate mines, flares and booby traps into defense. Record and report mine fields and remove and report upon displacement.

Disperse key personnel and facilities to lessen the chance of loss from single enemy rounds.

Maintain a reserve to repel and destroy penetrations.

Plan overhead cover on all positions whenever practicable.

Dig trenches and positions in a staggered manner to reduce the chance of the enemy using enfilade fire.

Keep crew served weapons ready for use at all times. Keep them and their sights covered.

Be sure that there is always someone alert in each position.

Establish multiple communications means.

Use trip flares along fixed positions perimeters.

Bury electrical wiring to claymore mines to restrict detection. Check daily for operational readiness.

Use illumination rounds outside the perimeter once the enemy has launched his attack.

Deny the VC any opportunity to remove casualties from the battlefield.

Vary times of relief for patrols and out-posts so as not to set a pattern.

Use simple related challenges and passwords in the operational areas.
For example: Car-Buick, Fruit-Apple, Animal-horse.

When stopping overnight during an operation, try to set up defenses before dark.

Pass the defense plan to all interested parties.

Dont's

Do not get complacent because of the lack of enemy action.

Do not allow civilians in or near the perimeter or positions.

Do not fire illumination rounds at regular intervals.

Booby Traps

Do's

Remember the VC make wide use of booby traps at every opportunity.

Learn to recognize the signs of booby traps emplacement. Favorite locations of the VC are: On gates, on fording sites, along trails, near stepping stones at stream crossings, in gaps in thicket fences, in rafters, on doors and on abandoned equipment and weapons.

Destroy booby traps in place using demolition charges or by remotely activating the trip wire.

Use local nationals to precede you through suspected areas whenever possible. They will avoid known traps.

Dont's

Do not cross rivers and streams at prepared shallow crossing sites without carefully searching out the approaches.

Do not establish a pattern of movement along trails at anytime.

Do not enter a fenced yard through a gate without searching out the immediate area.

Do not move troops in a close formation through suspected danger areas. Maintain a minimum of 15 meters between individuals to avoid multiple casualties.

Base Camp

Do's

Prepare protective shelters adjacent to sleeping areas.

Know your defense sector and that of the man on your left and right. Plan protective wire, mines (primarily Claymore) and flares on the perimeter.

Plan for illumination in event of a night attack.

Plan for a reaction force to counter any enemy success.

Rotate units and individuals on routine operations such as guard and listening posts so as to prevent individuals from becoming bored and lax.

Provide for alternate communications means.

Bury electrical wires to mines to prevent detection and/or sabotage.

Use dismounted vehicle guides when operating under blackout.

Develop a good civic action program in areas adjacent to or near the base camp.

Provide test fire pits for weapons.

Practice good maintenance with all equipment.

Require all personnel to take malaria pills.

Dont's

Do not allow civilians in the area.

Do not chamber a round until you are in your defensive position.

Do not change guards and outposts at regular intervals.

Do not relax vigilance at anytime - the VC capitalize on laxity.

Intelligence

Do's

Insure that all personnel are aware of the procedures for handling of prisoners, wounded VC and captured documents and materials.

Train all personnel to report everything - Who, What, Where, How, Why and action taken.

Take supporting intelligence elements on operations to insure prompt intelligence action.

Organize, train and use long range and stay behind patrols at every opportunity.

Take interpreters with you on operations.

Sanitize uniforms, equipment and personal property, such as wallets, before each operation.

Whenever possible use cameras to gather and document intelligence information. Require all captured documents, weapons, equipment and any other materials be turned in. Use VC Captured Document - Material Tags.

Practice counterintelligence at all times.

Dont's

Do not discuss anything classified over radios or telephones without first encoding it.

Do not compromise your action by early release of plans or by uncontrolled discussions of planned operations.

Do not spread rumors.

Artillery

Do's

Provide artillery units with additional security forces.

Employ air observers and AIR CAP during all moves.

Plan fires in support of convoy movements along entire tours.

Move firing batteries by "leap frogging" if other artillery to support the move is not available.

Shoot in check rounds along route during movement, when coordination has been effected.

Attempt to spring ambushes by probing likely sites with artillery fires, when coordination has been effected.

Maintain strict radio discipline.

Recon suspected enemy positions with fire.

Plan for extra WP and Smoke ammunition to be used for marking targets.

Keep all weapons prepared for immediate action at all times.

Provide a reaction force at all times and practice immediate action drills to make reaction instinctive.

Rotate personnel on local security to increase alertness.

Make range cards for all crew-served weapons.

Maintain clear fields of fire.

Plan mutual supporting defensive fires between artillery units.

Use concertina around the entire position.

Stress light and noise discipline at night.

Off-load basic loads and vehicle sandbags in base camp to lengthen the life of vehicle suspension system.

Plan artillery fire on objective areas and on key terrain features around landing zones in coordination with the airlifted element.

Emphasize accuracy of fires at all echelons.

Use artillery fire to identify planned concentrations and to orient friendly troops moving through dense foliage.

Drill each howitzer crew periodically with live ammo on the conduct of minimum range direct fire techniques and procedures.

Shoot in defensive concentrations prior to darkness.

Change battery positions frequently.

Establish as many free fire zones as possible.

Coordinate all means of fire support and make it immediately responsive.

Be prepared to conduct all-around fires in more than one direction simultaneous.

Teach FAC's the procedures for adjusting artillery fire.

Keep your powder dry while protecting your ammunition.

Use VT fuze to attack snipers in treetops.

Dont's

Do not let indigenous personnel including children inside a battery perimeter.

Do not use radio for non-essential traffic.

Do not open ammunition until it is to be used.

Do not leave any equipment, e.g., flares, mines, tin cans, unspent powder, in abandoned positions.

Do not tolerate sloppy gunnery procedures.

Do not move without adequate security.

Do not position artillery adjacent to villages.

Do not shoot when aircraft are operating in the field of fire.

General Cultural

Do's

Try to learn and use Vietnamese language.

Be sincerely courteous. Even if your gesture is not understood, the courtesy will be appreciated.

Use a title of rank or the word "Mister" rather than call an individual by his first or last name.

Pay respects to all clergy, by a slight nod of the head when you meet, including Buddhist Monks and Catholic priests.

Accept refreshments when visiting a Vietnamese.

Dont's

Do not enter anyone's home socially unless invited in.

Do not prop your feet on a desk or table, put a leg over the arm of a chair, or sit cross-legged when talking with Vietnamese.

Do not summon a Vietnamese by gesture.

Do not worry about time - be patient.

Do not violate the customs of the people.

Miscellaneous

Do's

Critique all operations - learn from every mistake.

Train Infantry and Armor personnel in the adjustment of mortar and artillery fire.

Keep all personnel informed and well oriented.

Encourage individual ingenuity and reward outstanding accomplishments.

Dont's

Do not condone complacency and slovenliness at anytime.

SOURCE: Headquarters, Field Force Vietnam

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APPENDIX III

LESSONS LEARNED

"AIRMOBILE SMALL UNIT COMMUNICATIONS"

These excellent reports on Airmobile Small Unit Communications at the squad, platoon and company levels were compiled by the 1st Air Cavalry Division at An Khe. It is a "wrap-up" of communications problems during their first three months of active operations against the Viet Cong. These reports cover the transition of communications from a peacetime training base to a full scale counterguerrilla war.

Part I — Platoon and Squad

1. "Platoon/squad communications, within the 1st Air Cavalry Division, were almost totally accomplished by radio. Some wire was used on special occasions, such as on outpost operations. WD-1 field wire, weighing 49 pounds per 1/2 mile, was replaced by Canadian field wire, weighing nine pounds per 1/2 mile. This lighter wire met all requirements and was a much welcomed advancement to the squad members who carried the wire. TA-1 telephones were used as the terminal instruments.

2. "The primary squad radio is the AN/PRC-6. This radio is not satisfactory in that it is too bulky, too heavy and too awkward to use when wearing a helmet, and requires that spare batteries of an excessive weight be carried by squad members. Although all PRC-6 radios, within the Division, were new or totally rebuilt in stateside depots prior to the Division's movement in August 1965, they failed at such a high frequency that many platoons and squads were required to carry spares on operations to ensure communications. The range of the PRC-6 in dense undergrowth, when functioning at its best, is less than 1/4 mile. Many platoons and squads were equipped with AN/PRC-25's prior to moving out on an important mission. Squad and platoon leaders were most willing to carry the additional weight of the PRC-25 because of its reliability.

3. "When using the PRC-25, smaller units always carried the RC-292 antenna, minus several of the mast sections and less most of the guy ropes. If a decision was made to halt in-place for more than 15 minutes, the RC-292 was raised and utilized. Most of the time, trees were used as the mast. On occasion, mast sections were improvised from bamboo or other trees. It was SOP throughout the 1st Air Cavalry Division that

the RC-292 antenna be erected whenever time permitted, even though communications existed at the time with all stations in the net. With rapid air movement capability within the Division, small units would be displaced five to ten miles in a matter of minutes and the installation of the RC-292 ensured maximum communications capability at all times. The antenna is good; however, at times, the operator forgot to change the ground plane elements when he changed from a lower to a higher frequency. Unless taught properly, the operators may think the extra elements with the RC-292 are only for replacement and may tend to "leave them behind" when going on an operation which may require frequency changes.

4. "A definite need exists for a suitable squad radio with a range capability of one mile. It is the opinion of most that the radio should be a transceiver. During air assault test, several foreign, Civilian Band radios were used on several small operations. These radios cost $18.00 each and held up during extended field use for the duration of the tests. Should one have broken down, it would probably have been thrown away in that it probably cost more to repair. It is believed that this type radio has a place in the Army.

5. "As mentioned, the PRC-25 was used quite often at the squad and platoon level. Due to the requirement for the radio operator to carry his weapon in a ready position and to use his hands for movement through brush and undergrowth, it was difficult for him to also hold the handset for monitor purposes. This problem was solved by the use of the H-161/GR headset/microphone, modified by the removal of one earpiece. This headset can be comfortably worn, both with a helmet or soft cap. The one earpiece was removed to enable the operator to hear local commands. The normal handset, still connected to the PRC-25 radio was carried in the web harness of the operator and was readily available to the platoon leader. This arrangement proved to be extremely beneficial, not only that it freed the operator's hands, but permitted him to monitor all receptions and transmissions resulting in fewer requests for retransmissions due to double monitoring. A need exists for such a headset/microphone to be made as an accessory to the PRC-25.

6. "Problems were experienced with standard PRC-25 handset, particularily when operating in rice paddy areas. Moisture, acquired by complete submersion of the handset soon made it inoperative. Each company was issued spare handsets, as float, prior to each major operation to alleviate the immediate problem. Handsets were also used while encased in the plastic bags issued with batteries as protective covering or encased in plastic food container bags (Baggies). This field expedient retarded moisture; however, at the same time, reduced volume of reception and transmission. MWO's have been submitted on these handsets; however, waterproofing modifications either have not been made or have been inadequate. On many occasions, the radio operator with radio and handset have been forced to become completely submerged due to enemy

action. On all known occasions, the radio worked perfectly and lack of transmission capability resulted from the wet handset. Once "baked out" in the sun or by other means, the handsets became operational. Until these handsets are made waterproof, units using the PRC-25 should be authorized to carry a reasonable float (1 per 5 handsets authorized) for replacement purposes.

7. "The PRC-25 has been used effectively as a beacon in conjunction with the AN/ARC-54 FM radios with 'homers' that are installed in the newer helicopters. The keyer accessory transponder, KAT-25, manufactured by RCA, of which several were obtained by the Division prior to overseas movement, has been used successfully. This keyer has been used to provide for an unattended beacon with the PRC-25. This keyer is designed to key the transmitter when an interrogating signal, from an FM ground or airborne radio, is received. Different codes can be preselected which are transmitted from a predetermined time interval (30 seconds minimum), after which time the radio automatically reverts back to the receive mode until again interrogated. The use of this keyer has been particularly valuable for marking pickup zones when the AN/ARC-54 radio with 'homer' is used as the interrogator.

8. "Radio operators are high priority targets of the Viet Cong. On one operation, near Plei Me, operators carrying the AN/PRC-25 were easily identified in that they were the only ones carrying a clearly outlined pack. Within a one hour period, a small unit replaced three operators who were hit by enemy fire. When it was realized that the operator was a prime target, actions were taken to camoflauge back pack radios with burlap sandbags and burlap strips in order to break up the outline of the pack. Burlap covered PRC-25s in combat elements are now SOP within the Division.

9. "In summary, lessons learned at the platoon/squad level were:

a "Lightweight wire (Canadian) is easier to carry and provides excellent communications.

b "AN/PRC-6 radio is not satisfactory. It has not proven reliable and, when working, has insufficient range.

c "AN/PRC-25's, although heavier than the hand-held PRC-6's, are carried on occasions at the platoon/squad level in order to ensure reliable communications.

d "Use of RC-292 antenna with the AN/PRC-25 radio whenever possible. This is especially true in an air mobile environment.

e "Carry the minimum components of the RC-292 antenna, however, do not forget the ground plane elements that may be needed if frequencies are changed.

f "Modified headset/microphone sets utilized with the AN/PRC-25 proved beneficial to operators when going through brush or when maximum alert with weapons was required.

g "Plastic bags helped to prevent excessive moisture in handsets of the PRC-25.

h "Present AN/PRC-25 handsets require further waterproofing and "Press to Talk" switch is faulty and requires too much finger pressure.

i "A standardized keyer accessory transponder used with the AN/PRC-25 can be utilized with long range patrols and as marker beacons.

j "AN/PRC-25 radios were camouflaged with burlap (sand bags) and shreds of bags to break up the outline."

SOURCE: Headquarters, 1st Cavalry Division (AM)

Part II Airmobile Infantry Company Communications

1. "Airmobile Infantry Rifle Companies are designed to enable the rapid deployment of the entire company personnel and total equipment by Army helicopters. As a result, all communications equipment is man-portable. The only vehicles within the companies consist of 2 truck platforms (Mules) which are used primarily for transporting ammunition and rations, when the operation permits.

2. "Radio is the primary means of communications to the platoon and to higher headquarters. Wire is seldom used except for intercommunication between local outposts, when established. At the company level, as well as at the platoon level, the light-weight Canadian wire is preferred because of the reduced weight when compared to WD-1 TT wire (9 lbs equivilant to 49 lbs). The primary FM radio is the AN/PRC-25, again, as with the platoons, the same lessons were learned. The RC-292 antenna was always used, when time permitted. Ground, point to point ranges of the radio, using RC-292's, at times exceeded 25 miles and were very dependent on site location.

3. "Infantry, Artillery and Cavalry Commanders at all echelons, were very cognizant of the importance of their communications and on all occasions gave the transport, protection and location of their radios the highest of priorities. There has been no period, known to the Division Signal Office, when any of the 1st Air Cavalry Division's Infantry companies were not in communications during an operation. The command emphasis placed on the care, use and protection of the radios is considered the main reason for this accomplishment.

4. "One FM net existed between the company and the platoons. This was entirely adequate to accomplish all missions. Three nets existed between the battalion and its companies. Two were FM, using PRC-25s at the company level. The third net was SSB-AM, utilizing the AN/PRC-47 battery operated, portable (2 man) radio at the company. One FM net was for command, the other for administration and logistics. Both at battalion and company the S-4 sections operated the Adm/Log radios. Initially, during the testing of the Air Mobile concept in 1964, there was only one FM net between battalion and company. Due to the extreme importance of keeping the command channel free during flash type operations, it was essential that a second FM net for resupply, evacuation and administrative purposes be established. By using airborne FM relay in support of these command nets, the battalions were able to maintain constant contact with their companies. The AN/PRC-47 SSB radio was seldom used, due to the reliability of the FM radios. However, it was occasionally used when companies were spread at exceptional distances (30-40 miles) from each other and/or the battalion. Due to its weight, with operational accessories, of 84½ lbs, commanders were reluctant to use the radio unless FM operations were questionable.

5. "A lighter weight SSB radio is required and would be particularily valuable for long range patrols or units operating at extreme distance when automatic airborne relay is not available, due to weather or higher priorities. PRC-47 SSB radio, when taken on operations where ranges were extreme for the FM sets, quite often proved their value in that, in the absence of airborne relay, they provided the sole communications link to higher headquarters. Some commanders always wanted both SSB and FM radios with them on operations and "locked on" the two sets almost as if they represented two different Signal means. This has proven to be "almost true" in that one set could, many times, "get thru" when the other couldn't due to range, atmospheric, noise or terrain conditions.

6. "The Company commanders were allocated H-13 helicopters for support for reconnaissance or control. The PRC-25 radio was utilized by the commander, while airborne, for command purposes. All H-13 helicopters were provided with an external antenna clamped to the right skid strut with a coaxial cable extending into the cockpit, via an existing hole on the underside of the aircraft and located between the two seats. The PRC-25, with normal antenna detached, was then connected to the H-13 improvised antenna and was either set on the floor of the helicopter or held in the lap of the commander or operator. This installation provided for safer and better communications than that previously experienced, when the normal PRC-25 antenna was extended out of the door of the aircraft. All new LOH aircraft should have similar antenna built in for use with PRC-25. There were times, when using PRC-25 radios from aircraft, that friendly frequency interferences were created by the transmissions. It was learned that the emissions sometimes "slopped" over to adjacent channels. Refinement of the PRC-25 in the area of frequency band width should clear up this problem.

7. "In summary, lessons learned at the company level were:

a. "Commanders recognition of the importance of transporting, protecting and locating radio equipment, to ensure maximum communications capability, "paid off".

b. "Two FM nets were normally required between battalion and company to ensure one net totally free for command.

c. "A light weight SSB is required for battalion and company communications.

d. "Automatic airborne FM radio relay is essential for extended distance operations in Vietnam.

e. "PRC-25 antenna modification for H-13 helicopters proved effective and contributed towards safety and improved air to ground operations for commanders. Consideration is recommended for a helicopter antenna, permitting rapid installation, be made an accessory item to the AN/PRC-25. Also recommend that LOH type aircraft be equipped with built in FM - VHF antenna and coaxial cable extenstion for commanders use with PRC-25 radio."

SOURCE: Headquarters, 1st Cavalry Division (AM)

APPENDIX IV

"VIETNAM - THE AREA OF OPERATIONS"

JANUARY - DECEMBER 1965

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1. The US Military Build Up in Vietnam in 1965.

The Republic of Vietnam (RVN) has been harassed by Communist-instigated guerrilla warfare since it first obtained independence from France. The assistance provided to the government of Vietnam by the United States since 1954 has been increasing steadily for twelve years. It started as an economic effort in 1954. In 1961, our military assistance to South Vietnam was increased in both advisory and special forces areas. In January 1965, US military strength in Vietnam was 23,000; 12,000 of which were members of the US Army. By the end of the year, our total military strength in Vietnam approximated 181,000. Of this number, over 100,000 were members of the United States Army, Vietnam. The following is a capsuled sketch of this dramatic and informative period.

In January 1965, US military strength in the Republic of Vietnam was 23,000 (12,000 Army).

In February 1965, Viet Cong guerrillas attacked Camp Holloway, just outside Pleiku, and the US billeting area of II Corps Headquarters compound with mortar and recoilless rifle fire. This prompted President Johnson to order the evacuation of American dependents from this war-torn country. A terrorist attack on an enlisted hotel billet in Qui Nhon leveled the four story structure. The first US air strike was flown against North Vietnam. A 600-man Korean advance party arrived in Saigon. They were the forerunner of a 20,000 man force - part of the Free World effort to stop the spread of communist aggression. A two-battalion force of US Marines plus supporting units landed at Da Nang to relieve Vietnamese troops of the responsibility of security duties at the strategic air base.

In March 1965, the first USAF plane was shot down by communist MIG's North Vietnam. The 3d Battalion of the 9th Marine Division landed at Da Nang. A bomb-laden terrorist car, parked in front of the American Embassy in downtown Saigon, exploded, ripping out the front wall of the Embassy, killing sixteen persons and wounding a hundred and forty-four.

In April 1965, the 1st Logistical Command was activated with headquarters at Tan Son Nhut, near Saigon. The mission of the 1st Logistical Command was to provide logistical support, less aviation supply and maintenance, to US

armed forces; and to furnish selected common user supplies and services to other components and Free World Military Assistance Forces (FWMAF). The 1st Logistical Command mission encompassed an area support concept. The Saigon Support Command was responsible for the logistical support in the III and IV Tactical Zones (CTZs). The Nha Trang Support Command was responsible for the the lower half of the II CTZ. The Qui Nhon Support Command was responsible for the upper half of the II CTZ. US air activity over North Vietnam increased. Two separate landings at Da Nang brought an increase of 4,500 US Marines into Vietnam.

In May 1965, the first US Army ground combat unit was committed in Vietnam. Paratroopers of the famous 173d Airborne Brigade (Separate) left Okinawa by C-130 aircraft and began landing at 0530 hours, 5 May, at the Bien Hoa Air Base. In rapid succession, a total of 150 C-130's arrived with more troops. The brigade moved into perimeter defense positions around the air base and immediately started counterinsurgency operations. The mission of the 173d was to defend the Bien Hoa Air Base. Elements of the brigade were employed simultaneously in defense of the Vung Tau airfield. The peculiar nature of counterinsurgency operations in Vietnam dictated new tactics and techniques. Operations included search and destroy missions, and patrol actions. The entire sector to be defended by the brigade was called the Tactical Area of Responsibility (TAOR); any combat unit arriving thereafter was assigned a TAOR. The VC attacked the provincial capital of Song Be. The Bien Hoa Air Base was racked by a series of accidental explosions and a number of aircraft were destroyed.

In June 1965, US military strength in the Republic of Vietnam was 52,000. US Army troops strength rose to 18,000. The first troops of the 1st Battalion, Royal Australian Regiment arrived. The hustle and bustle of arrivals and departures at the busy Tan Son Nhut Airbase civilian passenger terminal was interrupted by a Viet Cong terrorist bomb explosion on the morning of 16 June. The inhumane act injured forty-six, thirty-four of whom were American servicemen. The first MIGs were shot down by US Navy planes over North Vietnam on 17 June. On 18 June, a massive bombing attack on Viet Cong strongholds in the dense jungles of War Zone "D" was carried out by twenty-seven Strategic Air Command B-52 bombers. The attack was designed to break up a suspected surprise attack by Viet Cong forces on one or more villages or district towns. It marked the first use of the giant Stratofortress bombers in Vietnam. They dropped 750 and 1000-pound bombs on the enemy stronghold at the apex of their round-trip flight from Guam. Forty-two persons were killed and eighty-one wounded Friday evening, when two Claymore mines exploded outside the My Canh floating restaurant in the Saigon river, hurling pellets into the crowd of late evening diners. Survivors of the first blast began fleeing out the front entrance of the restaurant, when a second mine detonated. The US Marine Corps airstrip at Chu Lai opened for business 1 June, at its seaside location fifty miles south of Da Nang. The airstrip was designed to relieve part of the heavy operations load on Da Nang airfield.

In July 1965, the United States Army, Vietnam (USARV) was activated with headquarters at Tan Son Nhut near Saigon. 8,000 more Marines landed at Da Nang and Qui Nhon. Nine hundred soldiers of the historic "Fighting First" Infantry Division arrived at the Bien Hoa Air Base, where they joined the 173d Airborne and a Royal Australian Regiment in defending the Bien Hoa complex. Additional landing teams of the 1st Infantry Division's 2d Brigade landed at Cam Ranh Bay, 180 miles northeast of Saigon, to boost defenses planned for a key port facility there. The Military Assistance Command,on 15 July, confirmed the presence of the 101st Regiment of the People's Army of North Vietnam in the Republic of Vietnam. Secretary of Defense Robert S. McNamara and General Earle G. Wheeler, Chairman of the Joint Chiefs of Staff, arrived in Saigon 16 July, for top level briefings by US and Vietnamese officials. The Secretary visited troops throughout Vietnam and the Seventh Fleet. A shipload of 3,700 "Screaming Eagles", members of the Army's famous 101st Airborne Division, First Brigade, landed at Cam Ranh Bay, where they were met by two former commanders — US Ambassador Maxwell D. Taylor and COMUSMACV General W. C. Westmoreland. The airborne troopers deployed in the Cam Ranh Bay area and took up defensive positions to protect the vital site of a projected multi-million dollar port facility. On 17 July,B-52 bombers supported a ground operation. The first US aircraft was shot down by surface to air missiles over North Vietnam on 24 July. In retaliation,US aircraft hit two SAM sites northwest of Hanoi on 27 July. US military strength in Vietnam totalled 80,000 by the end of July.

In August 1965, the Viet Cong overran the district headquarters and Special Forces camp at Dak Sut, 280 miles northeast of Saigon. The attacking force was estimated at communist battalion strength. All US personnel escaped. A Viet Cong mortar attack on Bien Hoa on 24 August damaged forty-nine aircraft. President Johnson signed the 1965 Military Pay Raise Bill 21 August, explaining, "It is the soldiers, sailors, airmen and Marines — not the weapons, ships or planes — who are the real bulwark of our military might." The bill raised the pay for all members of the armed forces beginning 1 September. President Johnson also authorized the fighting men in Vietnam free postage.

In September 1965, the 1st Cavalry Division (Airmobile) off-loaded at Qui Nhon and began to set up its headquarters and base camp at An Khe, 225 miles north of Saigon. Almost 16,000 strong, the unit introduced in Vietnam the latest concepts in combat methods - that of an airmobile division.

In October 1965, Secretary of Defense Robert S. McNamara approved the awarding of a medal for US servicemen who have served in Vietnam or the waters and air around it since 3 July. Servicemen who served in the Vietnam area before 3 July may choose the new theater medal instead of the Armed Forces Expeditionary Medal previously authorized. US Navy jets destroyed for the first time a mobile SAM site in North Vietnam. For eight days the ten-man Special Forces team at Plei Me and two companies of Montagnards held

off a superior force of Viet Cong and North Vietnamese Army regulars. The engagement began 19 October, and reaction forces, including elements of the 1st Air Cavlry rushed to the besieged camp's defense. The ensuing battle left more than 1,000 dead insurgents strewn on the battlefield. Follow-up actions in the Ia Drang valley, near the Cambodian border, resulted in routing and killing more than 1,800 VC by the 1st Air Cavalry and Vietnamese forces with heavy air support. General Westmoreland said, "When the dust of the battle settled, the American troops were present to clear the battlefield of killed and wounded, both friendly and enemy. The enemy had fled the scene." On 27 October the VC attacked US Marine Corps air installations at Da Nang and Chu Lai.

In November 1965, the 173d Airborne Brigade fought in War Zone "D". President Johnson proclaimed 28 November as a "day of dedication and prayer" honoring the men and women of the Republic of Vietnam, the United States and all other countries who are risking their lives to bring about a just peace in Vietnam. He emphasized that the United States "remains ready without condition for the international discussions that can lead to lasting peace."

In December 1965, in another of their periodic "liberation" efforts, the Viet Cong on 4 December set off a huge explosion near the Metropole Enlisted Quarters in Saigon, killing eight persons and wounding another hundred and thirty-seven. A heavy toll of casulties resulted among Vietnamese civilian bystanders. US Air Force F-105 Thunderchief jets roared across the 17th Parallel 15 December, and bombed the industrial complex around the port city of Hai Phong, knocking out the Uong Bi thermal power plant. It marked the first time air strikes hit the industrial complex. The power plant supplied fifteen per cent of the power needs for North Vietnam, including power for industries both in Hai Phong and Hanoi. The fighting in South Vietnam was largely suspended during a Christmas truce, although small-scale sporadic clashes were reported during the thirty hour period. Ground fighting resumed 25 December. The US air strikes against North Vietnam remained suspended, however, and no attacks were reported through year's end. The Army's 1st Logistical Command supplied a total of 270 tons of turkey, potatoes, dressing, cranberry sauce, peas and buns to troops in II, III and IV Corps areas for the traditional Christmas dinner, topping of the feast with fruitcake, pumpkin or mincemeat pie.

By year's end, US military strength in the Republic of Vietnam approximated 181,000; over 100,000 of which were US Army forces assigned to USARV. As of 31 December 1965, the following were major subordinate units of USARV:

Field Force, Vietnam
1st Infantry Division
1st Cavalry Division (AM)

173d Airborne Brigade (Separate)
1st Brigade, 101st Airborne Division
5th Special Forces Group
30th Corps Artillery
23d Artillery Group
97th Artillery Group (AD)
18th Engineer Brigade
12th Aviation Group
17th Aviation Group
1st Logistical Command
Aircraft Maintenance and Supply Group
2d Signal Group
89th Military Police Group
US Army Special Troops
525th Military Intelligence Group

The locations of major units, port areas, and places mentioned in this volume are as shown on the map (See Map 1).

2. Vietnam - The Environment.

Vietnam, shaped like a hugh "S", forms the east coast of the Indo-Chinese Peninsula. It is bounded in the North by China; in the East by the Pacific Ocean; in the South by the Gulf of Siam; and in the West by Cambodia and Laos. Northern Vietnam is a mountainous high region though its peaks do not reach a great height. Central Vietnam, a sort of long irregular corridor joining the North to the South, is made up of a series of small hill plains drained by relatively short streams rising in the "Cordillera of Vietnam" called Trong Son. The indented coast of headlands and bays sketches a great convex across the island scattered sea. South Vietnam is a flat country. It results from the emersion of a shallow sea bed, silted up with the deposits of the Mekong which finishes its course here in a vast delta. It can be said that South Vietnam is the magnificent gift of the Mekong.

In the north, the climate is substantially similar to that of Southern China. It is characterized by a wide difference between summer and winter temperatures and by sudden changes. The central region is the transition zone which progresses to the southern climate of a simple monsoon type. The southern area is characterized by the consistency of temperatures, the distinctly alternating monsoons and the regularity of the rainy season.

In South Vietnam, the Mekong and its wide flung arms drain all the country. The entire delta of South Vietnam is furrowed by many little streams, tributaries of the bigger rivers, and by a multitude of canals which form an excellent network for navigation and irrigation.

The area of South Vietnam covers approximately 66,000 square miles. It is approximately 700 miles long and, its width ranges from 40 miles in the north to 120 miles in the south. The Annamitique Mountain chain covers the northern two-thirds of South Vietnam; the remainder is a low-land delta formed by the Mekong River. Vegetation in the country consists of densely forested highlands, grassy rolling plains in the central section, and rice fields and marshy mangrove swamps in the South. The major lines of communications are the North-South National Coastal Highway and railroad route, two East-West routes, the Mekong River, and numerous canals in the delta. These are shown on Map 2.

South Vietnam is inhabited by 15 million people, of whom the Vietnamese constitute the predominant racial element. Although of small stature and frail appearance, the Vietnamese is robust and resilient. Over long centuries he has been subjected to the Chinese influence, which has permeated his character and manifests itself in many spheres. He is a man of the plains, rejecting highlands and preferring to leave the mountains and forests to the racial minorities.

3. Terrain Analysis of the II and III Corps Tactical Zones.

a. II Corps Tactical Zone - Terrain Analysis.

The geographic make-up of the II Corps Tactical Zone consists of three major types of terrain. These types are highlands, upland plains, and coastal plains.

Approximately three-fourths of the area is highlands in which are found hills and mountains characterized by steep slopes, sharp crests, and narrow valleys. Most peaks are from 2,000 to 6,000 feet above sea level. Conditions for ground operations throughout this region are poor all during the year due to limited lines of communications. The predominant vegetation consists of dense broadleaf evergreen forests with small areas of deciduous forests.

The upland plains consist of gently rolling grass covered plains. Although there are few roads in the region, vehicles could move over the terrain except during the wet season.

The coastal plain is that area between the sea coast and the fingers of the two mountain chains that run the length of the highland area. Small silty deltas are formed by the streams as they empty into the South China Sea. Rice paddies are numerous and some of the larger cities are found here (See Map 2).

b. III Corps Tactical Zone - Terrain Analysis.

The III CTZ lies in the transitional zone between the lowland delta and the highlands. Almost all of the zone is flat to rolling plain. To the west of Saigon, lie rice fields and marshes which are inundated during the wet season and have soft soil throughout the year. To the southeast of Saigon, in the delta area of the Dong Nai and Saigon Rivers, is a mangrove swamp with the highest elevation being ten meters above sea level. Near Saigon are many population settlements, orchards and plantations. To the east, the terrain is gently rolling and covered with cultivated fields, rubber plantations or dense forests with thick undergrowth. To the north and northwest, the terrain is gently rolling and covered with dense forest or open forest.

Trafficability for troops is fair except for the areas west and southeast of Saigon. The heavily forested parts of the other areas and the rice fields restrict vehicle traffic to the roads (See Map 2).

4. The Weather - October to December 1965.

a. Weather Zones.

By simplification of the weather patterns, South Vietnam is divided into three zones for this discussion. The first zone covers most of the country, including the delta and southern lowland areas, upland plains and mountains or highlands. The second zone is the eastern coastal area from the NVN-SVN border south to the vicinity of Phan Rang. The third zone is a transitional zone between them. The transitional zone is not discussed because the weather characteristics are merely intermediate between those of the other two zones, which differ greatly, and because precise weather data is lacking for the transitional zone.

b. General.

A period of transition from southwest to northeast monsoon began in late September and continued through October. By mid-November the northeast monsoonal pattern was well established and dominating the weather over all of South Vietnam.

c. Highlands and Southern Lowlands Zone.

Throughout this zone, rainfall decreased steadily in both frequency and amount, and reached a minimum for the period in December. An area surrounding Dalat and Ban Me Thuot and extending southwest through the delta, generally received precipitation ranging from 12 to 21 inches during October, five to nine inches during November, and one to three inches in December. A few areas received rainfall somewhat greater than this general

range, and the areas around Pleiku and Kontum received less rain than did the remainder of the zone. Despite the decreasing cloudiness, temperatures did not differ greatly from those of the preceding quarter, due to the influence of the relatively cool northeastern air flow. Average temperatures ranged from the high 60's and low 70's in the highlands to the low 80's in the delta region; maximum temperatures seldom exceeded 90 degrees F. Humidity averaged generally about 80 to 90%, except around Pleiku and Kontum where the average humidity declined to about 75%.

d. Eastern Coastal Zone.

The period of transition to the northeast monsoon brought increasing rainfall and decreasing temperatures to the eastern coastal zone. The rainfall was heaviest and most frequent in October, when rain fell on 15 to 22 days throughout most of the zone. Amounts ranged from less than 10 inches at the southern end of the zone to nearly 30 inches around Qui Nhon and Bong Son. In November and December, the frequency of precipitation remained about the same, but the amounts decreased to about half those of October. The weather of November and December was characterized by frequent periods of low overcast and light to heavy drizzle which interfered with air operations. The heavy rains of October brought to the coastal zone the problems of poor soil trafficability, road deterioration and damage to equipment and supplies resulting from excess moisture. Average temperatures declined during this period to the mid-70's, while maximum temperatures seldom exceeded the low 90's. Along the shores of the coastal zone, the trafficability of the sand was improved by the rains; however, the influence of the northeasterly winds caused frequent medium to heavy surf conditions which hampered cargo unloading operations (See Map 3).

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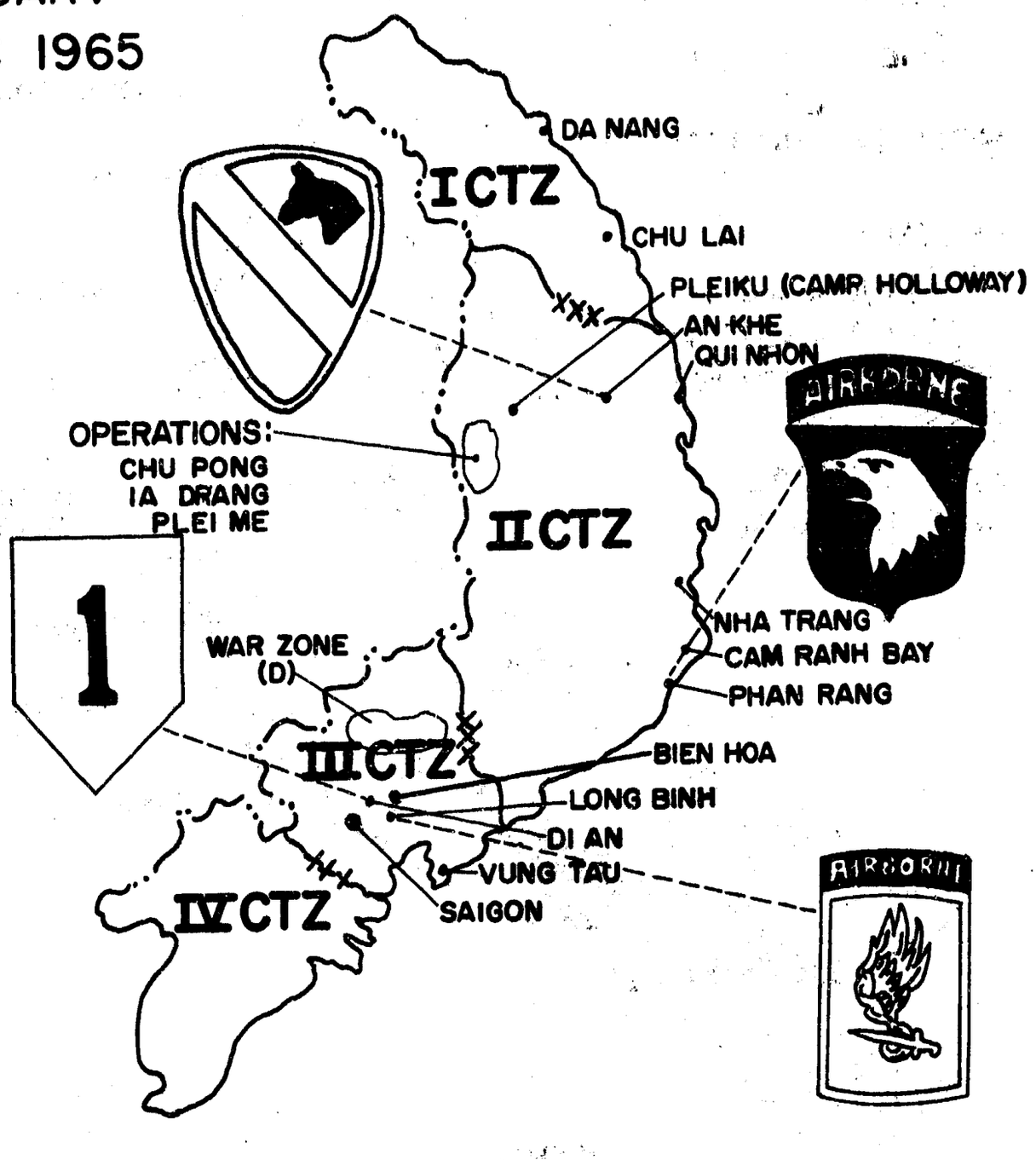
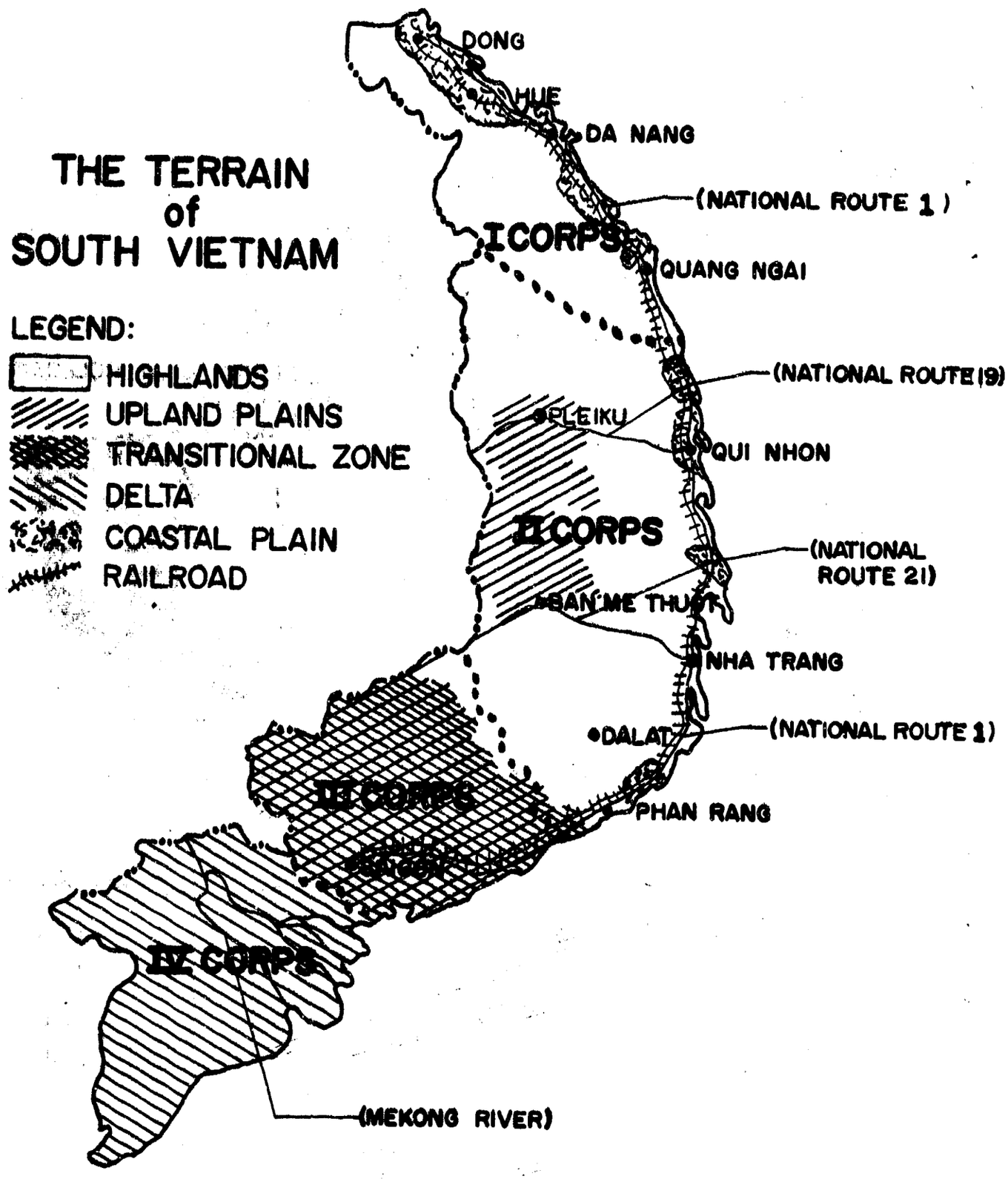
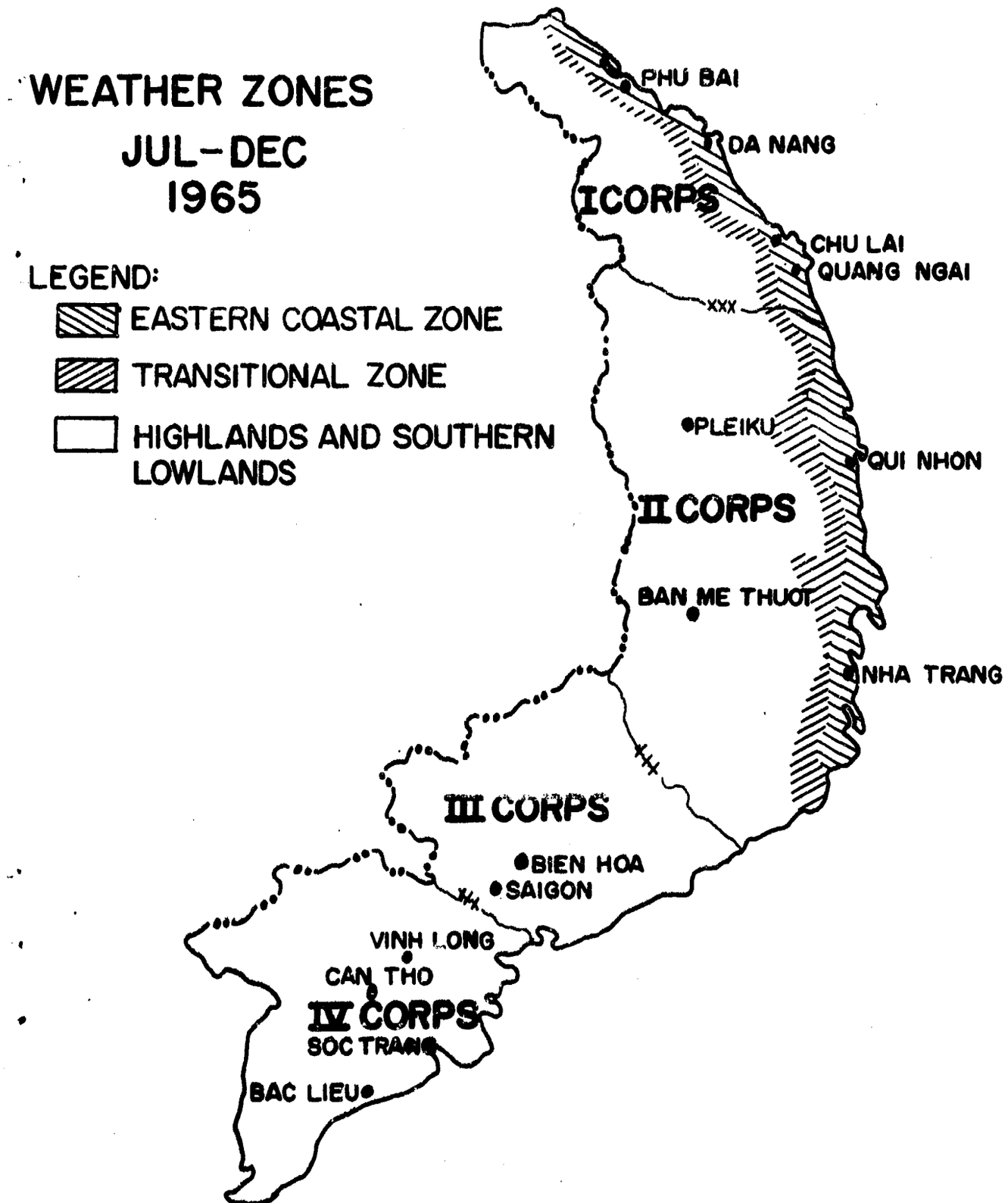
USARV
DEC 1965



MAP 1


THE TERRAIN
of
SOUTH VIETNAM
LEGEND:
HIGHLANDS
UPLAND PLAINS
TRANSITIONAL ZONE
DELTA
COASTAL PLAIN
RAILROAD
DONG
HUE
DA NANG
(NATIONAL ROUTE 1)
I CORPS
QUANG NGAI
(NATIONAL ROUTE 19)
PLEIKU
QUI NHON
II CORPS
(NATIONAL ROUTE 21)
BAN ME THUOT
NHA TRANG
DALAT
(NATIONAL ROUTE 1)
III CORPS
PHAN RANG
IV CORPS
(MEKONG RIVER)

MAP 2


WEATHER ZONES
JUL-DEC
1965
LEGEND:
EASTERN COASTAL ZONE
TRANSITIONAL ZONE
HIGHLANDS AND SOUTHERN LOWLANDS
PHU BAI
DA NANG
I CORPS
CHU LAI
QUANG NGAI
XXX
PLEIKU
QUI NHON
II CORPS
BAN ME THUOT
NHA TRANG
III CORPS
BIEN HOA
SAIGON
VINH LONG
CAN THO
IV CORPS
SOC TRANG
BAC LIEU

MAP 3

APPENDIX V

"ADDENDUM TO

'BATTLEFIELD REPORTS - A SUMMARY OF LESSONS LEARNED'

VOLUME 1

30 August 1965"

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1. General.

Volume 1 of "Battlefield Reports - A Summary of Lessons Learned" covers the initial engagements of the first US Army combat units employed in Vietnam. Volume 1 should be used in conjunction with Volume 2. They are not repetitious, but rather, together they give a picture of counterinsurgency warfare as we experienced it in 1965.

The reader will find the material in Appendix IV of Volume 2 applicable to Volume 1, except for the weather study. Therefore, information concerning the weather for the months of July through September 1965 is given below.

2. The Weather in Vietnam - July through September 1965.

a. General.

The period May through September 1965 was dominated by the southwest monsoon. In July and August, the peak effects of this monsoon were felt, with a decrease in these effects in September as the monsoon began to weaken.

b. Highlands and Southern Lowlands Zone.

Throughout this zone, precipitation frequencies and amounts were high; rain fell on 15 to 25 days each month. In the delta, and areas around Saigon, rainfall averaged 6 to 12 inches per month, but as much as 27 inches were received in some places. North through the highlands the pattern of high rainfall was much the same, but with somewhat lower temperatures due to increased elevation. Around Dalat and Ban Me Thuot, rainfall was received on 21 to 25 days each month, and averaged 9 to 13 inches per month; however, areas which received as much as 16 to 21 inches of rain were not uncommon. In the Pleiku and Kontum areas, rain fell on 20 to 25 days of every month, with amounts ranging from 13 inches up to more than 40 inches monthly in some areas around Pleiku. Throughout the zone, humidity remained high, averaging 80 to 90% and frequently approaching 100%. The high rainfall and humidity caused soils to turn to mud, roads to become untrafficable, and moisture-sensitive supplies and equipment to deteriorate. Maximum temperatures were moderated by the extensive cloudiness, generally being in the low to middle 80's, but occasionally reaching the low 90's on days of relatively

clear skies. Average temperatures ranged from about 57° at Dalat to the low 80's in the delta region.

c. Eastern Coastal Zone.

The eastern coastal zone experienced a substantially different weather pattern. The southwesterly airflow had dried out by the time it reached this zone. As a result, relatively little rainfall was received in this zone, on only 2 to 12 days each month, with amounts ranging from less than 2 inches at Qui Nhon to only about 12 inches near Nha Trang. Reduced cloudiness allowed maximum solar radiation with resulting high temperatures. Maximum temperatures averaged in the mid 90's, but frequently exceeded 100°F. Humidities averaged less than 75% in most areas. The combination of low rainfall, high temperatures and moderate humidity caused dry soil conditions, with resultant dust, grit and loose sand problems (See Map 3).