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DEPARTMENT OF THE ARMY
OFFICE OF THE ADJUTANT GENERAL
WASHINGTON, D.C. 20310

IN REPLY REFER TO

AGAM-P (M) (14 Apr 69) FOR OT UT 691153

22 April 1969

SUBJECT: Operational Report - Lessons Learned, Headquarters, 145th Combat Aviation Battalion, Period Ending 31 January 1969 (U)

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1. Subject report is forwarded for review and evaluation in accordance with paragraph 5b, AR 525-15. Evaluations and corrective actions should be reported to ACSFOR OT UT, Operational Reports Branch, within 90 days of receipt of covering letter.
2. Information contained in this report is provided to insure appropriate benefits in the future from lessons learned during current operations and may be adapted for use in developing training material.

BY ORDER OF THE SECRETARY OF THE ARMY:

Kenneth G. Wickham

KENNETH G. WICKHAM
Major General, USA
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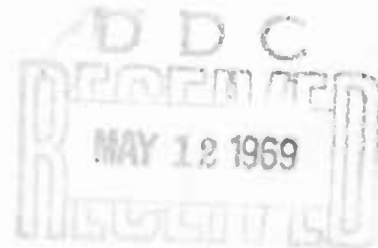
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145th Combat Aviation Battalion

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DEPARTMENT OF THE ARMY
HEADQUARTERS, 145TH COMBAT AVIATION BATTALION
APO San Francisco 96227

"FIRST IN VIETNAM"

AVGC-CC

12 February 1969

SUBJECT: Operational Report of 145th Combat Aviation Battalion for Period
ending 31 January 1969 (RCS CSFOR-65) (RI) (U) (UIC: WCYNAA)

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1. (C) Section 1. Operations: Significant Activities

a. Mission: The mission of this battalion has not changed during this reporting period and continues to be as follows: To augment the aviation capability of II Field Forces Vietnam and the Republic of Vietnam forces operating in the III Corps area.

b. Organization:

(1) The 135th Assault Helicopter Company was relieved from assignment to the 145th Combat Aviation Battalion and transferred to the 222nd Combat Aviation Battalion on 23 November 1968.

(2) During the reporting period, the AH-1G (Cobra) NETT (New Equipment Training Team) was redesignated the USARV AH-1G Training Team by 12th Combat Aviation Group letter dated 16 December, 1968. Training Team personnel and equipment responsibility (less operational control which remained at Headquarters, USARV) was assigned to the 145th Combat Aviation Battalion. Personnel (3 Off, 9 WO, and 26 EM) were authorized in HHC for this team and equipment as stipulated was assigned to the 334th Aerial Weapons Company.

(3) The organization of the 145th Combat Aviation Battalion during this reporting period included the units depicted on the organizational chart located at Enclosure 1.

(4) Department of the Army, Headquarters, USARPAC, General Order number 771, dated 22 November 1968 reorganized the 145th Combat Aviation Battalion under a new modified TOE. The new TOE inactivated the signal and maintenance detachments of each of the aviation companies and the personnel and equipment of these detachments were absorbed by their parent companies. The unit designations and TOE's of the parent units were changed as follows:

	UNIT	GENERAL ORDER	TOE
OLD	HHD, 145th Cbt Avn Bn	USARPAC 28 2 Feb 66	1-76F
NEW	HHC, 145th Cbt Avn Bn	USARPAC 771 22 Nov 68	1-256G
OLD	68th Aslt Hel Co	USARPAC 30 8 Feb 67	1-77G (PAC 1/67)
NEW	68th Aslt Hel Co	USARPAC 771 22 Nov 68	1-077G (PAC 2/68)

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	UNIT	GENERAL ORDER	TOE
OLD	118th Aslt Hel Co	USARPAC 30 8 Feb 67	1-77G (PAC 1/67)
NEW	118th Aslt Hel Co	USARPAC 771 22 Nov 68	1-077G (PAC 2/68)
OLD	190th Aslt Hel Co	USARPAC 104 6 Feb 68	1-77G (CONARC)
NEW	190th Aslt Hel Co	USARPAC 771 22 Nov 68	1-077G (PAC 2/68)
OLD	334th Armed Hel Co	USARPAC 203 20 Oct 67	1-77E (PAC 4/67)
NEW	334th Aerial Wpns Co	USARPAC 771 22 Nov 68	1-111T (PAC 1/68)

c. Significant personnel changes during the reporting period were as follows:

(1) Commanding Officer, 145th Combat Aviation Battalion 23 Dec 68

Outgoing: LTC Garald L. Waldron 073002
Incoming: LTC Carl H. McNair Jr. 072155

(2) Battalion Executive Officer

No Change

(3) Battalion S-1/Adjutant

No Change

(4) Battalion S-2 20 Dec 68

Outgoing: CPT Larry R. Page 05318557
Incoming: 1LT Charles E. John 05339798

(5) Battalion S-3

No Change

(6) Battalion S-4 13 Dec 68

Outgoing: MAJ Emmet R. Conrow 02291387
Incoming: CPT Rufus S. Manly 05424400

(7) Commanding Officer, HHC, 145th Cbt Avn Bn 21 Dec 68

Outgoing: CPT Michael W. Folkestad 05424374
Incoming: CPT George C. Coburn 05418942

(8) Commanding Officer, 68th Aslt Hel Co 16 Dec 68

Outgoing: MAJ Richard S. Daum 090745
Incoming: MAJ Donald I. Saethoff 099928

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(9) Commanding Officer, 118th Aslt Hel Co 21 Dec 68

Outgoing: MAJ Duane C. Ingram 074280
Incoming: MAJ John A. Britton C74967

(10) Executive Officer, 118th Aslt Hel Co 4 Dec 68

Outgoing: MAJ Bobby L. Moore OF 103880
Incoming: CPT Abner B. Chapman 05421331

(11) Commanding Officer, 190th Aslt Hel Co 12 Jan 69

Outgoing: MAJ Charles R. Byrd 085962
Incoming: MAJ Hershell B. Murray OF 102320

(12) Executive Officer, 190th Aslt Hel Co 17 Nov 68

Outgoing: MAJ John A. Lasch III OF 105731
Incoming: 1LT Herbert D. Dyer 05336034

d. Unit strengths as of 31 Jan 69:

(1) Military:

SUBORDINATE UNIT	OFFICER		WO		EM		TOTAL	
	AUTH	O/H	AUTH	O/H	AUTH	O/H	AUTH	O/H
68th AHC	19	21	51	41	218	210	288	272
118th AHC	19	19	51	46	218	205	288	270
190th AHC	19	19	51	42	218	204	288	265
334th AWC	17	15	39	38	196	189	252	242
HHC *	24	26	12	12	154	185	190	223
TOTAL	98	100	204	179	1004	993	1306	1272

* Includes personnel authorized and assigned to the USAFV AH-1G Training Team: Authorized 3 Officers, 9 Warrant Officers, and 26 Enlisted Men.

(2) Civilian:

SUBORDINATE UNIT	DAC		VN		TCN		CONTRACTOR	
	AUTH	O/H	AUTH	O/H	AUTH	O/H	AUTH	O/H
68th AHC	0	0	21	21	0	0	0	0
118th AHC	0	0	1	1	0	0	0	0
190th AHC	0	0	1	1	0	0	0	0
334th AWC	0	0	13	13	0	0	0	0
HHC	0	0	14	14	0	0	0	0
TOTAL	0	0	50	50	0	0	0	0

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(3) Personnel (enlisted) gains and losses for Nov, Dec, and Jan.

SUBORDINATE UNIT	NOVEMBER		DECEMBER		JANUARY	
	GAIN	LOSS	GAIN	LOSS	GAIN	LOSS
68th AHC	17	15	19	14	76	17
118th AHC	22	8	8	11	83	22
190th AHC	20	9	11	11	70	17
334th AWC	25	10	6	8	75	11
HHC	26	15	18	18	13	10
Sety Plt	17	4	1	1	0	2
430th	1	1	1	0	0	1
520th	0	0	0	0	0	0

e. Aircraft status as of 31 January 1969 (Incl 2).

f. Operational results as of 31 January 1969 (Incl 3).

g. Awards and Decorations: The following awards and decorations were received by members of this battalion during the period 1 November 1968 through 31 January 1969.

<u>AWARDS</u>	<u>NUMBER RECEIVED</u>
SS	3
LM	1
DFC	26
BS	32
AM-V	44
ACM-V	7
ACM	43
PH	5
AM	2037

h. Intelligence Situation and Physical Security

(1) During the period 1 November 1968 through 31 January 1969, enemy activities have generally fallen into two categories, relocation and resupply. Indications are that the enemy has moved from his traditionally "safe" areas and has assumed "close in" positions from which he can launch coordinated attacks with maneuver elements at his own discretion. The enemy has intensely been moving supplies south into areas well in front of his base areas for future use in an anticipated offensive. A large number of prepositioned caches have been found by friendly troops during search and destroy operations thereby greatly reducing the enemy's potential. The location, size, and contents of these caches substantiates a buildup for an extensive, well pre-planned future offensive.

(2) During this reporting period there were two attacks (2 Nov and 5 Dec) by mortar and rocket fire on Bien Hoa Air Base. There was no damage to the 145th Combat Aviation Battalion Area.

(3) The physical security of the battalion area has been significantly

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Improved to include an increased state of alertness commensurate with the enemy's relocation closer to the Bien Hoa Complex. The construction of 18 internal anti-sapper bunkers encircling the aircraft revetments contributes to an overall defense in depth. In addition to the normal outer perimeter guards, an eleven man walking guard has been added to the flight line area during the critical hours of darkness to protect against sabotage or sapper infiltration. These walking guards have already paid dividends as they have apprehended numerous unauthorized indigenous personnel on the flight line which may have gone undetected. These personnel are turned over to the local ARVN Military Police for questioning and disposition.

(4) An improved and more rigorous airfield defense plan was prepared and issued which provides for tighter, in-depth defense of the battalion area and the battalion section of the outer perimeter of Bien Hoa Air Base. The defense plan provides for company sectors of defense and fall back defense positions. In addition to defense in sectors, each company provides a 40 man vehicular mounted ready reaction force which can be deployed via pre-designated routes to pre-planned reinforcing positions in the event of ground attack. Perimeter fields of fire have been enlarged and expanded by clearing obstacles and burning grass and brush. Additional and improved fighting positions have been constructed across the perimeter and rehearsals of defensive actions by all personnel were accomplished during practice alerts both during the hours of daylight and darkness.

1. Operations

(1) Combat Operations: This battalion continues to be committed daily to tasks varying from direct combat support missions to battalion sized combat assault operations with the emphasis being on company size combat assault missions. The battalion is normally committed daily for two combat assault helicopter companies, one general support helicopter company, and a variety of armed helicopter missions, including three firefly teams from the 334th Aerial Weapons Company. The normal mission profile for the combat assault is nine UH-1D lift helicopters, one command and control helicopter, one maintenance helicopter, one smoke helicopter, and four armed helicopters from the unit's assets. In addition, dependent upon the distance to the area of operations, spare transport aircraft are taken on the mission as backup airer ft.

(2) Counter Mortar

(a) The Bien Hoa Air Base was subjected to enemy rocket/mortar fire on two occasions during this reporting period. These attacks occurred as shown below.

<u>Time/Date</u>	<u>Number of Rounds</u>	<u>Damage to 145th Battalion Area</u>
210602 November	6	None
222205 December	25	None

(b) During this reporting period, the 145th Combat Aviation Battalion

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retained the responsibility of primary command and control of all armed helicopter light fire teams utilized in support of Oplan Checkmate in the Bien Hoa - Long Binh Complex. A command and control helicopter conducts an initial area reconnaissance of the battalion area of responsibility immediately after dark and remains on ready alert at the battalion helipad throughout the hours of darkness. In the event of an attack or suspected attack on Bien Hoa, the C&C aircraft is launched immediately to control gunships committed to the defense of Bien Hoa and the surrounding area.

j. Training

(1) Mandatory training as outlined in USARV Regulation 350-1 and 12th Combat Aviation Group Regulation 350-1 is being conducted by all units of this battalion. During this reporting period the two and one half day modified training schedule reported in the last quarter has been expanded to include the full five day schedule used by the Screaming Eagle Replacement Training School. This was done to meet the full requirements of the above mentioned regulations and has been found to instill greater confidence in each individual of his own abilities. A comprehensive Battalion Training Directive was published and an intensive continuing training program implemented to further enhance unit readiness in all areas of operations and logistics.

(2) Assigned training tasks

(a) During this reporting period five VNAF aviators (1 staff officer and 4 VNAF pilots) completed transition training in the UH-1D and were awarded certificates of graduation. Currently there are 6 VNAF aviators (1 staff officer and 5 pilots) undergoing transition training in the UH-1D and 2 aviators in the UH-1C armed helicopter. The armed helicopter training is a first for VNAF aviators since all prior UH-1 training has been limited to transport operations.

(b) The battalion received seven allocations to the Navy's Jungle Environmental Survival Training School. Only four of these were utilized since three were subsequently cancelled. The unit objective continues to be a minimum of two qualified survival trained personnel in each company size unit.

k. Signal

(1) During this period, the battalion was able to complete all ZYR avionics retrofits and all but two aircraft had the ZYS retrofit completed. The MWO for installing an FM volume control in the aircraft with ZYR and ZYS advanced at an extremely satisfactory rate since the MWO was approved and currently 93.1% of all UH-1 series aircraft have had it applied with only six aircraft remaining to be modified.

(2) The use of the KY-28 (Secure Voice) COMSEC device between the 145th Combat Aviation Battalion Headquarters (BOC) and the II Field Force Army Aviation Element has definitely established its merit and utility. The battalion has now established a similar battalion secure net thereby providing a safe and rapid method of transmitting unit missions and situation

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reports to and from the Battalion Operations Center and other units or sections within the battalion. With the installation of KY-28's in assigned aircraft, it is now possible for the unit operations sections or the BOC to have direct, secure voice communications with an aircraft while on an assigned mission. This net will be further expanded on or about 15 February 1969 when AN/PRC-77 radios will be issued to all units within the battalion. These radios when used with the KY-28, will provide each unit with additional secure ground radio communications.

(3) The 1877th Communications Squadron is currently constructing two additional cable telephone trunks for the local Bien Hoa common user telephone system. This expanded service will permit the more expedient handling of telephone requests within the battalion and should allow some reductions in the battalion installed and serviced landline network. Although the common user system is more sophisticated and permanent in nature, the battalion sole user system will be maintained for back-up to perimeter bunkers and operations centers.

(4) On 22 January 1969, the direct support avionics detachments were deactivated and the personnel and equipment therein were assigned to the parent companies as indicated below:

282nd Signal Detachment assigned to 68th Aslt Hel Co (MTOE 1-77G)

198th Signal Detachment assigned to 118th Aslt Hel Co (MTOE 1-77G)

320th Signal Detachment assigned to 334th Aerial Wpns Co (MTOE 1-111T)

Since the direct support avionics unit (9th Sig Det) of the 190th Assault Helicopter Company had previously been detached and assigned to the 3/17th Air Cavalry Squadron, the responsibility for direct support avionics of the 190th had been delegated to the 198th Signal Detachment. With its deactivation and reassignment of personnel and equipment to the 118th Assault Helicopter Company, the 190th was essentially left without avionics support. The 12th Combat Aviation Group has now provided for the assignment and transfer of the personnel and equipment of the deactivated 243rd Signal Detachment to the 190th Assault Helicopter Company. This action is to be accomplished on or about 4 February 1969.

1. Logistics

(1) Class III: The refueling point at Ham Tan was transferred from battalion operational control on 22 November 1968.

(2) Class V:

(a) Basic loads and operational loads are being maintained in accordance with USARV Reg 735-28. This incorporates the basic load of each unit with the current authorized operational load and allows for a better management tool. These stocks are maintained at a battalion ammunition supply point.

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(b) During this reporting period, difficulty has been experienced in obtaining adequate quantities of XM-229 (17 lb warheads) and proximity fuses due to non availability.

(3) Construction: On 15 January 1969, engineers began the construction of 25 prefabricated revetments. This construction will provide eight new revetments and remodeling of 17 temporary revetments which were constructed of salvage bomb containers and sandbags. Upon completion, adequate revetments will be available for all operational assigned aircraft, however should the units ever receive a full TOE issue of aircraft, a shortage of revetments could develop.

(4) PA&E, (Pacific Architects and Engineers) is under contract with the United States Army to provide repair and utilities support for the 145th Combat Aviation Battalion. Three serious problem areas continuously plague the units because of inadequate support. Of these, water, electric power, and sewage, the most critical is the electrical power because it in turn affects the water and sewage. From 1 November 1968 to 31 January 1969 the 145th Combat Aviation Battalion has experienced 1845 hours without electrical power. This loss of power directly affects aircraft maintenance, operations, and security since sustained night operations are far more difficult under improvised lighting systems. Security is greatly reduced when power fails and all lights are extinguished. PA&E support has declined to little more than emergency assistance in these areas and as a result, expedients such as organic and borrowed generators are drawn into service, but not without undue delay. In addition to the direct effect on maintenance, security and night operations, the continuing deterioration of utilities support presents a serious sanitation and morale problem within the units. Command correspondence and every action possible has been taken at this level to obtain relief in this critical area.

m. Safety

(1) During the period 1 November 1968 through 31 January 1969, the 145th Combat Aviation Battalion experienced 5 major accidents and 3 incidents in 32,584 flying hours. This was a rate of 15.34 per 100,000 flying hours.

(2) On 17 January 1969, an ARVN soldier was killed when he inadvertently walked into the tail rotor of a UH-1D helicopter. As a result of this incident, when aircraft are to be on the ground for an extended period of time with the engine running, either the crew chief or gunner will exit the aircraft and position himself to observe the tail rotor to prevent a recurrence of this type of incident. As an additional preventative measure, since the battalion habitually supports Vietnamese units, the words "Nguy Hiem" (Vietnamese for Danger) have been stenciled on the tail boom immediately above the red "DANGER" arrow pointing to the tail rotor.

n. Flight Standardization

(1) During this reporting period, attention has been focussed continuously on re-evaluation and up-dating of the standardization and training

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programs to insure standards of flight proficiency and standardization of procedures among aviators, instructor pilots, and standardization instructor pilots throughout the battalion. This standardization program is designed to reduce unit accidents and assure that aircraft are operated within prescribed limits published in the appropriate operators handbook and flight standardization maneuver guides.

(2) The common problem of the availability of qualified, experienced armed helicopter pilots continues to exist. To meet the mission requirements a program was established to insure that each armed helicopter on a combat mission is flown by a pilot qualified in accordance with the provisions of 1st Aviation Brigade Regulation 95-8. This program is conducted at unit level, and monitored by the battalion standardization officer who is available to give assistance in ground and/or flight instruction. All armed helicopter pilots now receive a quarterly armed helicopter standardization check ride administered by an armed helicopter instructor pilot with unit instructor pilots being checked by the battalion standardization instructor pilot.

o. Medical

(1) The flying hour program outlined in 12th Combat Aviation Group message # 10838 "Utilization of Aircraft Assets" dated 19 October 1968 has proven extremely valuable in reducing aviator fatigue within this battalion. Under the restrictions of this message, the ground commander has been limited to nine (9) hours mission time and to six (6) hours blade time per aircraft.

(2) The frequent and continuing power failures within the 145th Combat Aviation Battalion containment area results in a shortage of water because well pumps and boost pumps are inoperative without electricity. Sanitation problems are compounded by the lack of a continuous and adequate water supply in that commodes are frequently clogged and filled with human feces. Whenever the water supply fails, the lack of water for bathing has a deteriorative effect on overall sanitation and tends to undermine the morale of the men. All available means of organic support are being used to augment the electrical power and rectify water deficiencies in order to sustain operations.

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2. (c) Section 2... Lessons Learned: Commanders Observation, Evaluation, and Recommendations

a. Operations

- (1) Use of the AH-1G for emergency evacuation of downed crews.

(a) OBSERVATION: This battalion has the mission of providing three firefly teams nightly for the III Corps tactical zone. Each firefly element consists of two AH-1G and one UH-1D helicopters. Recently, on two separate missions, the UH-1D light ship was shot down and with no other utility helicopters in the immediate area. It was essential that the crew be rescued by one of the AH-1G helicopters.

(b) EVALUATION: The first rescue was accomplished by carrying the three crew members on the ammunition bay doors with a full load of turret ammunition. The pick-up presented no problem for the pilot or the aircraft, but the additional weight added to the front of the aircraft caused a potentially critical forward shift in the center of gravity. This caused a partial loss of aft cyclic, thereby requiring the pilot to make a running landing. In addition, one of the crew members almost fell off of the ammunition bay door while in flight. Battalion pilots were briefed concerning the problems encountered and seat belts were installed on the ammunition trays of all AH-1G helicopters. The second time a rescue was effected using an AH-1G helicopter in which the turret ammunition had been expended prior to pick-up, four crew members were retrieved and the evacuation was accomplished with no major problems encountered.

(c) RECOMMENDATIONS:

1 If an emergency evacuation is to be performed using the AH-1G helicopter, every effort should be made to expend all ammunition in the forward turret prior to pick-up.

2 Seat belts should be installed on the ammunition bay doors on both sides of the AH-1G helicopter.

3 All aviators should be cautioned about the C.G. limitations of the AH-1G and the problems which would be encountered if a pick-up is made with a full load of ammunition in the forward compartment.

(d) COMMAND ACTION:

1 All pilots flying AH-1G aircraft have been informed of the problems which can be expected when performing an emergency evacuation. All aircraft have had seat belts installed on both sides of the aircraft in the ammo bays.

2 Supported units have received briefings on the proper methods of boarding the AH-1G when an emergency evacuation is necessary.

- (2) Loss of the tail rotor 90 degree gear box on the AH-1G.

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(a) **OBSERVATION:** Within the past 30 days, the USARV AH-1G Training Team, attached to the battalion, has experienced two tail rotor failures and the associated loss of the 90 degree gear boxes on AH-1G helicopters during training flights. The loss of the tail rotor and gear box resulted in one crew member being seriously injured and two aircraft receiving major damage. It is felt that if the two AH-1G's had been carrying more than a 50% ammunition load in the turret, the sudden forward shift in the center of gravity would have resulted in an uncontrollable nose low attitude and a tragic accident.

(b) **EVALUATION:** While the loss of the tail rotor and 90 degree gear box did cause the aircraft to have a large forward shift of the center of gravity, the pilot was able to maintain enough control to land in a level attitude without a fatality. The 50% ammunition load in the turret was considered to be the limiting factor which precluded the C.G. from moving to a catastrophic forward position.

(c) **RECOMMENDATIONS:** Until the cause of the failure of the tail rotor and 90 degree gear box has been eliminated, the maximum load carried in the forward ammunition compartment should be limited to 50% of the maximum capacity.

(d) **COMMAND ACTION:** All AH-1G aircraft assigned to this command are restricted to 50% of their usable ammunition load for the XM-28 turret until reinspection of tail rotor hubs is accomplished.

(3) **Survival kits for pilots**

(a) **OBSERVATION:** Due to the non-availability of authorized survival kits, units of this battalion have assembled a kit containing essential items for survival. This kit is contained in a 5.56 MM ammunition can and was initially carried in the nose compartment of the AH-1G and cargo compartment of the UH-1 aircraft.

(b) **EVALUATION:** The 145th Combat Aviation Battalion has had numerous aircraft shot down by enemy automatic weapons fire in which none of the crewmembers were able to retrieve their survival equipment. The first aircraft had the survival kit strapped behind the pilots seat. The aircraft burst into flames on impact and the pilot was unable to get to the kit due to exploding ordnance. In the second aircraft, the kit was kept in the nose compartment of the aircraft, however, when the aircraft crashed, the nose was damaged to the extent that nothing stored there was accessible. In both of these incidents the aircraft were in insecure areas and the pilots had no method of communicating with rescue aircraft. It is considered that the optimum solution is for the survival equipment to be attached to the individual. The survival vest (FSM# 4220-800-006) presently in use by the Air Force is an ideal container for the type of survival equipment needed by Army pilots. In both of the above mentioned incidents, crews could have expedited their rescue or if the situation had developed that they had to escape and evade, their chances would have been greatly enhanced had they been issued the survival vests.

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(c) RECOMMENDATIONS

1 The survival vest FSN# 4220-800-006, presently in use by the Air Force, should be made available immediately to Army aviators with particular emphasis being placed on AH-1G "Cobra" pilots.

2 Until such time that the vests are available, all units should be made aware of the problems which may be encountered in locating survival equipment in downed aircraft.

(d) COMMAND ACTION: Survival vests have been requested through normal supply channels; however, at this time these vests are not available through Army supply.

(4) Use of the 2.75" FFAR with Flechette warheads:

(a) OBSERVATION: The introduction and availability of the 2.75" FFAR Flechette warhead provides one of the most lethal munitions available for employment from an aerial weapons platform. Its coverage and effectiveness against troops in the open or lightly protected targets mark it as a significant improvement over existing warheads and greatly enhance the capability of the helicopter to provide direct fire support. For suppressive fire or landing zone preparation purposes, the lethal area of a flechette warhead is more than 20 times greater than that of a 10 lb warhead with point detonating fuze. Hence, the potential is far reaching and additional employment should produce outstanding results. At the present time employment is prohibited in the close proximity of ground troops; however, the term "close proximity" is relative and not defined.

(b) EVALUATION: In the interest of utilizing the warhead, not in "close proximity" but "in support" of friendly troops, an analysis was conducted to determine what the minimum safe distance for employment should be. This analysis, attached as Inclosure 4, considered all aspects of delivery ranges, lethal areas, dispersion, and fuze arming distances. Based on the data available, it was concluded that a minimum safe distance of 500 meters laterally and 1000 meters longitudinally from the target would produce negligible risk to friendly troops.

(c) RECOMMENDATION:

1 The minimum safe distance for employment of flechette warheads in support of friendly troops should be specified as 500 meters laterally and 1000 meters longitudinally.

2 Armed helicopter crews should train towards the employment of the flechette warhead by improving range estimation procedures and utilize the optimum delivery slant range of 3000 feet as a standard of performance.

3 Appropriate arsenals and test activities in CONUS should be requested to specify a minimum safe distance utilizing the results of tests already accomplished on known distance ranges.

(d) COMMAND ACTION:

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1 A command letter ~~addressing~~ the use of flechette warheads and the recommendations outlined above was forwarded to the Commanding Officer, 12th Combat Aviation Group for consideration and referral to higher headquarters, if appropriate.

2 Armed helicopter crews were briefed on the characteristics of the flechette warhead and the inherent dangers, limitations and effectiveness thereof. In no case will the munition be used closer than 500 meters laterally or 1000 meters longitudinally to friendly troop dispositions.

(5) Direct Fire Support of Friendly Forces:

(a) OBSERVATION: Three incidents have occurred during the reporting period in which friendly troops were wounded by the supporting fires of armed helicopters. Two of these cases occurred during the hours of darkness and in one incident, supporting fires were requested within thirty-five meters of the friendly troops.

(b) EVALUATION: Armed helicopter support is one of the most responsive supporting fires a ground commander can obtain, sometimes being quicker than artillery. Because of this, ground commanders continue to demand more from the armed helicopters and rightfully so; however, all too frequently the ground commander and aviator both overlook the inherent inaccuracy of aerial gunnery from a relatively unstable platform traveling at 100 knots. This coupled with the fact that the munitions themselves are not 100% true to the targets leads to unfortunate incidents which, if allowed to go unchecked, could undermine the mutual confidence of the ground commander in one of his most valuable supporting weapons system. It is essential that ground commanders be apprised of the limitations of the aerial weapons and cautioned about calling for fires closer than the relative accuracy of the system and munition being utilized. Recognizing that this is a continuing process of evaluation and education, it is the aviator who must call these factors to the attention of the ground unit as they are asked to bring the fires in closer. Without a doubt, when the tactical situation dictates, armed helicopters can place discrete fires as close as any other system other than a direct fire weapon fired by the soldier on the front, but there is an element of risk involved and friendly casualties may result. In order to minimize such incidents and casualties, the fire team leader should not make a strike within 150 meters of known ground troop positions without advising the ground commander that the fire may endanger his own troops. If the ground commander determines that the strike should still be made, he should warn his troops so that they can take appropriate cover and then the strike will be placed exactly as requested.

(c) RECOMMENDATIONS:

1 Ground units should always mark their most forward trace with smoke or panels and give range and azimuth to the target to the supporting fire team.

2 Armed helicopters, prior to bringing a strike closer than 150 meters to friendly troops, should advise the ground commanders of the possible

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danger to friendly troops.

3 Ground commanders upon receiving the caution from the fire team leader should then caution his troops that a strike is about to commence and hasty cover should be taken.

(d) COMMAND ACTION: This unit has implemented procedures which contain the recommendations cited above with no noticeable reduction in requested support or support provided. The caution has been utilized by the air crews and accepted by the ground commander thereby eliminating any misunderstanding that may arise over close in fires.

(6) Personnel Injured by Tail Rotor Strikes:

(a) OBSERVATION: During January an ARVN soldier walked directly into the tail rotor of a helicopter sitting on a road at flight idle. The helicopter was in an insecure area with contact in progress only a short distance away; therefore, the crewchief and gunner remained on board the aircraft to man their guns while the passengers debarked. In spite of a shouted warning by a ground advisor some distance away, the soldier walked head on into the spinning blade, killing him instantly.

(b) EVALUATION: The location described above was in a remote area occupied by RF/PF forces not familiar with helicopters. The soldier may well have been totally ignorant as to the danger of the spinning blade and consequently blindly walked by the tail boom. Had a more immediate warning been present or a crewmember standing beside the aircraft, the accident may have been prevented.

(c) RECOMMENDATIONS:

1 Unless the tactical situation absolutely dictates, a minimum of one crewmember should dismount to assist in the loading and unloading of passengers and to keep personnel and vehicles clear of the main and tail rotor blades.

2 For those units who habitually support ARVN forces, the words "Nguy Hiem" (Vietnamese for "DANGER") stenciled immediately above the red DANGER on the tail boom may serve as a positive warning to persons unfamiliar with the danger of the tail rotor.

(d) COMMAND ACTION: The above recommendations have been implemented within this command and were forwarded to higher headquarters in the report of accident investigation.

b. Radio teletype employment

(a) OBSERVATION: Due to the ineffectiveness of the radio teletype set AN/VSC-2 and AN/MRC-119 high frequency radios to transmit over short distances, this battalion has been experiencing difficulty in determining the operational readiness of the equipment.

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(b) **EVALUATION:** The radio teletype set AN/VSC-2 and AN/MRC-119 high frequency radios are ineffective over short distances (less than 30 miles). Because of this problem, the operational status of the sets could not be determined without displacing the units beyond the minimum range or entering the tactical nets of non-associated units located some distance away. It was determined that the receiver portion of the set, including the teletype, could be checked by tuning into the UPI high frequency radio teletype news circuit. The receivers of both the VSC-2's and MRC-119's are now checked weekly by tuning to the UPI frequency, thereby insuring that the sets are operational. In order to test the output, the battalion's assigned HF frequency is tuned and a dummy load and watt meter placed on the antenna output. Operator proficiency is maintained by employing them on the landline teletype circuit within the battalion headquarters, or through the use of the point-to-point, landline practice circuits as required.

(c) **RECOMMENDATIONS:** Recommend that any units experiencing difficulty checking the readiness of High Frequency radio transmitter units contact their local MARS station for the frequencies of UPI news network and test the AN/VSC-2 and AN/MRC-119 high frequency radios in the manner described above.

(d) **COMMAND ACTION:** The 145th Combat Aviation Battalion now maintains operator proficiency and conducts operational checks on high frequency radios by use of the UPI high frequency radio teletype news circuit.

c. ZYR/ZYS Retrofit:

(a) **OBSERVATION:** Difficulty is experienced in keying the KY-28 COMSEC equipment when installed in the UH-1 series aircraft.

(b) **EVALUATION:** Because of the location of the KY-28 within the chin bubble of the UH-1 series aircraft, it is very difficult to install and once installed it is difficult to key. If the need arises to re-key while the aircraft is operating, the individual who is using the KY-28 Key Gun to key the set must insure that the aircraft is not above flight idle and preferably that it is shut down since full left pedal must be applied to allow clearance for the Key Gun to be inserted into the KY-28. This action is difficult and sometimes takes an excessive amount of time when a good key is not accomplished.

(c) **RECOMMENDATIONS:** That the KY-28 be relocated to the nose radio compartment where the key can be changed with the aircraft running and be more readily accessible.

(d) **COMMAND ACTION:** The 145th Combat Aviation Battalion has submitted an EIR to CG, US STRATCOM CMD suggesting that the KY-28 be relocated to the radio compartment in the nose of the aircraft.

4 Incl

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Incl 2 and 3 wd Hq DA

Carl H. Mc Nair, Jr.
CARL H. MC NAIR, JR.
LTC, Infantry
Commanding

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AVGC-SC (13 Feb 69) 1st Ind
SUBJECT: Operational Report of 145th Combat Aviation Battalion for Period
Ending 31 January 1969 (RCS CSFOR-65) (RI) (U) (UIC: WCYNAA)

DA, Hq, 12th Cbt Avn Gp, APO 96266 19 Feb 69

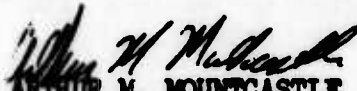
TO: Commanding General, II Field Force Vietnam, APO 96266

1. In accordance with USARV Reg 525-15, the Operational Report - Lessons Learned of 145th Combat Aviation Battalion, for the period ending 31 January 1969, is forwarded.
2. Reference Section 1, Operations, para 1k(4). The 9th Signal Detachment was not assigned to 3rd Sqdn 17th Air Cavalry, but was assigned to the 11th Armored Cavalry Regiment.
3. Reference Section 1, Operations, para 1l(4). Command correspondence has been directed to 1st Aviation Brigade in an effort to solve this problem.
4. Reference Section 2, Lessons Learned, para 2a(2). 34th Transportation Grp (Aircraft Maintenance) advises that the problem has been identified and corrected. AH-1G's should now be capable of carrying 100% ordnance in XM-28 systems.
5. Reference Section 2, Lessons Learned, para 2a(4). Until more accurate data is available, as a result of testing and experience, the minimum safe distances as recommended will be considered appropriate.
6. Reference Section 2, Lessons Learned, para 2a(5). It is felt that the arbitrary distance of 150 meters, regardless of mission profile, is not usable nor an appropriate distance. This distance is dependent on many factors, only a few of which are: ordnance, mission profile, weapons system used, crew training and proficiency, and protection available to friendly troops.
7. Reference Section, Lessons Learned, para 2b. The use of UPI high frequency radio teletype network is a method of checking the receiver of the VSC-2's and MRC-119's; however, operational checks can better be made by sending and receiving traffic with another station. Using the whip antenna, the 145th Combat Aviation Battalion VSC-2 could be checked by establishing contact with 12th Combat Aviation Group. There

AVGC-SC (13 Feb 69) 1st Ind 19 February 1969
SUBJECT: Operational Report of 145th Combat Aviation Battalion for Period
Ending 31 January 1969 (RCS CSFOR-65) (RI) (U) (UIC: WCYNAA)

is no minimum range as referred to in the attached ORLL. Command action taken includes advising the 145th Combat Aviation Battalion of the above and setting aside a period in which the set may be checked by entry into the 12th Combat Aviation Group net.

FOR THE COMMANDER:


ARTHUR M. MOUNTCASTLE
Captain, Infantry
Assistant Adjutant

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AVFBC-RE-H (13 Feb 69) 2nd Ind
SUBJECT: Operational Report of 145th Combat Aviation Battalion for Period
Ending 31 January 1969 (RCS CSFOR-65) (R1)(U) (UIC: WCYNAA)

DA, II FFORCEV, APO San Francisco 96266

12 MAR 1969

THRU: Commanding General, 1st Aviation Brigade, ATTN: AVBA-C, APO 96307

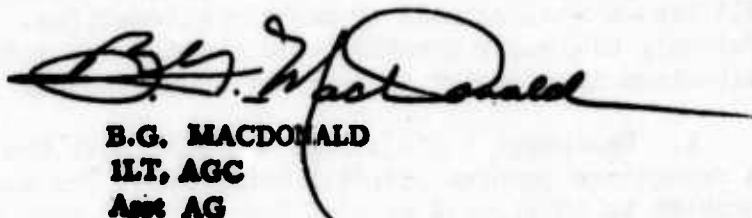
Commanding General, US Army Vietnam, ATTN: AVHGC(DST), APO 96375

Commander-In-Chief, US Army Pacific, ATTN: GPOP-DT, APO 96558

TO: Assistant Chief of Staff for Force Development, Department of the
Army, Washington, D.C. 20310

This headquarters has reviewed and concurs with the Operational Report-
Lessons Learned of the 145th Combat Aviation Battalion for the period
ending 31 January 1969, as indorsed.

FOR THE COMMANDER:


B.G. MACDONALD
1LT, AGC
Asst AG

AVRAGC-O (12 Feb 69) 3d Ind

SUBJECT: Operational Report - Lessons Learned of the 145th Combat Aviation Battalion for the Period Ending 31 January 1969, RCS CSFOR-65 (R1)

DA, HEADQUARTERS, 1ST AVIATION BRIGADE, APO 96384 14 MAR 1969

THRU: Commanding General, United States Army Vietnam, ATTN: AVHCC-DST,
APO 96375
Commander-in-Chief, United States Army Pacific, ATTN: GPOF-OT,
APO 96558

TO: Assistant Chief of Staff for Force Development, Department of the Army, Washington, D. C. 20310

1. This Headquarters has reviewed this report, considers it to be adequate and concurs with the contents as indorsed, except as noted below.

2. The following additional comments are considered pertinent:

a. Paragraph 1 1(2)(b), Page 8. The comment is valid. This rocket XM-229 (H488) was placed in short supply. Available assets were frozen. All issues will be made by monthly allocations. During the first part of February all major commands were queried for monthly requirements. This situation is expected to last for approximately 3 to 4 months.

b. Paragraph 1 1(4), Page 8. The 145th Combat Aviation Battalion has a recognized problem with all utilities. The solution to their electrical problem is in process at this time. Based upon a DD Form 1391, Request for Construction, submitted to USARV on 28 January 1969, USARV is taking action to coordinate an interservice support agreement with the 7th Air Force (PACAF) to provide 780 KW of power to the Army at Bien Hoa. If approved and within the capabilities of the Air Force to provide this power, then the Army will provide funds for the cost of the electrical distribution system. If not approved, then MACV will have to provide an "add on" portion to the USAF contract to provide sufficient power. All indications are that this request will be approved. The additional electrical power will relieve the water problems at Bien Hoa because the pumps will be able to operate without electrical interruption. The most significant solution is in the planning stage at Bien Hoa installation which will provide for additional water supply, water storage, water distribution and a sewage system. The waterborne sewage system will also require an interservice support agreement with the 7th Air Force to support this portion of the project. All indications from USARV are that this will receive favorable action.

c. Paragraph 2a(3), Page 11. The observation and evaluation are valid. USARV Aviation Logistics Division is presently studying the problem. They are trying to acquire either the Air Force type vest or a similar type vest for Army use.

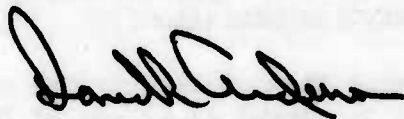
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AVBAGC-0

SUBJECT: Operational Report - Lessons Learned of the 145th Combat Aviation Battalion for the Period Ending 31 January 1969, RCS CSFOR-65 (R1)

d. Paragraph 2a(4), Page 12. Concur. As experience is gained through actual usage the minimum safe distance as mentioned will produce negligible risk to friendly troops. With the addition of tracer elements to the Flechette warheads programmed for September 1969, which will mark center and flanks of the lethal area, reduction of MED may result without increase in risk to friendly troops.

FOR THE COMMANDER:



DAVID R. ANDERSON
Cpt. AGC
Asst. AG

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AVHGC-DST (12 Feb 69) 4th Ind

SUBJECT: Operational Report of 145th Combat Aviation Battalion for Period
Ending 31 January 1969 (RCS CSFOR-65) (R1) (U) (UIC: WCYNAA)

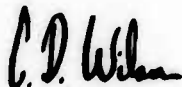
HEADQUARTERS, UNITED STATES ARMY, VIETNAM, APO San Francisco 96375 2 5 MAR 1969

TO: Commander in Chief, United States Army, Pacific, ATTN: GPOP-DT,
APO 96558

1. (U) This headquarters has reviewed the Operational Report-Lessons Learned for the quarterly period ending 31 January 1969 from Headquarters, 145th Combat Aviation Battalion.

2. (C) Reference item concerning Use of the 2.75" FFAR Flechette warheads, page 12, paragraph 2a(4) and 3d Indorsement, page 20, paragraph 2d; concur. Inclosure 4 of the report substantiates the field tested recommended safe distance for negligible risk of injuries to friendly troops. USARV will request the USA Material Command (USAMC) 2.75 inch Project Manager to obtain the minimum safe distance factors in meters from the appropriate CONUS agencies. Subject information will be disseminated to USARV units upon receipt.

FOR THE COMMANDER:



C. D. WILSON
1LT, AGC
Assistant Adjutant General

Cy furn:
145th Combat Avn Bn
1st Avn Bde

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GPOP-DT (12 Feb 69) 5th Ind (U)
SUBJECT: Operational Report of HQ, 145th Cbt Avn Bn For Period Ending
31 January 1969, RCS CSFOR-65 (R1)

HQ, US Army, Pacific, APO San Francisco 96558 29 MAR 1969

TO: Assistant Chief of Staff for Force Development, Department of the
Army, Washington, D. C. 20310

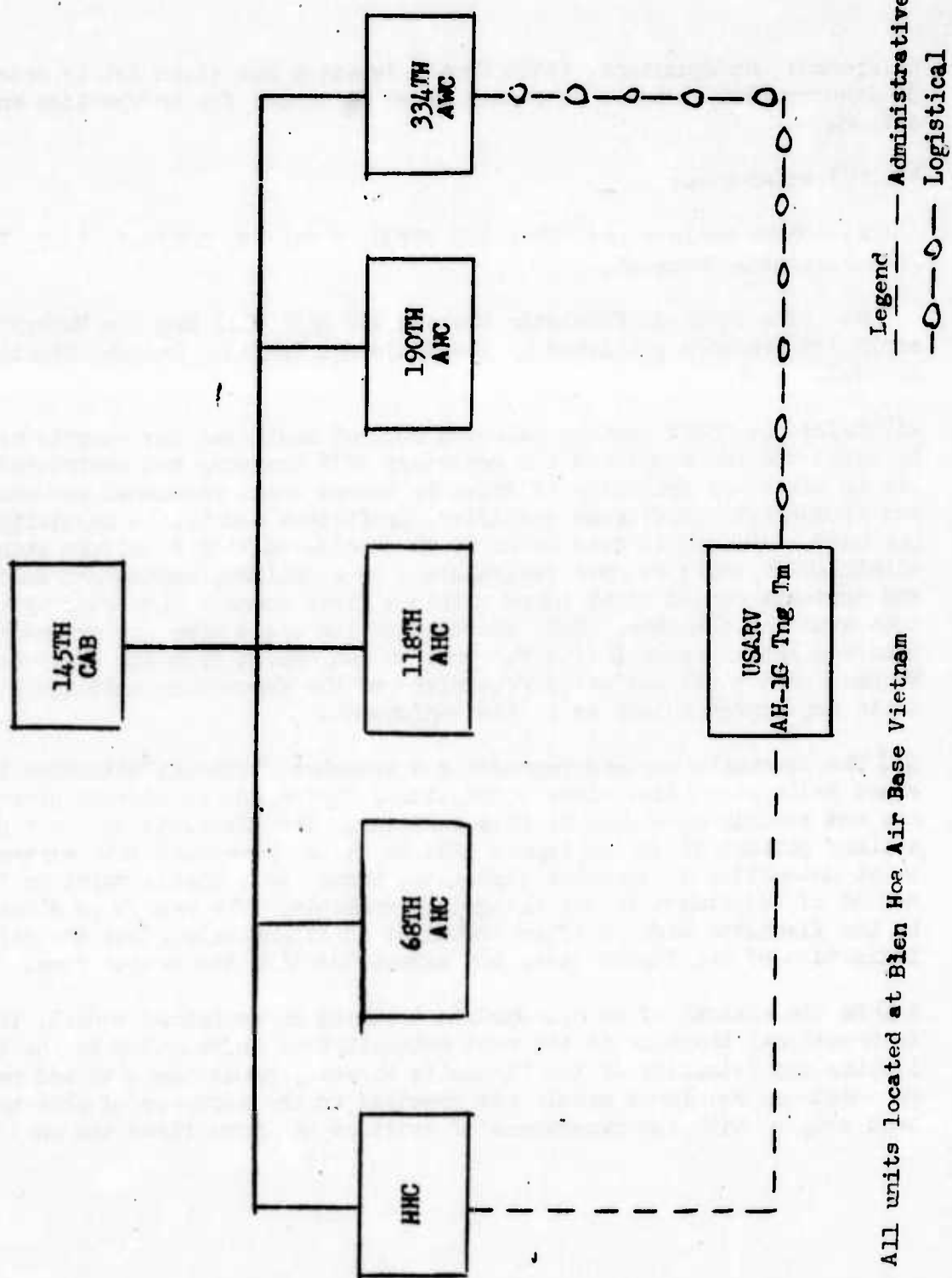
This headquarters has evaluated subject report and forwarding indorse-
ments and concurs in the report as indorsed.

FOR THE COMMANDER IN CHIEF:

C. L. Shortt

C. L. SHORTT
CPT, AGC
Asst AG

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All units located at Bien Hoa Air Base Vietnam

Inclosure 1 145th Aviation Battalion Organization

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Inclosure # 4 to 145th Combat Aviation Battalion Operational Report -
Lessons Learned

SUBJECT: Employment of WDU 4A/A Flechette Warheads

Reference: Headquarters, 145th Combat Aviation Battalion letter dated
30 January 1969, Subject as stated above is quoted for information and
action.

"1. (U) References:

a. USARV unclass msg AVHAV-LOG 72730, 5 Oct 68, Subject, "2.75 Inch
FFAR Flechette Warhead".

b. "The 20 Grain Flechette Warhead WDU 4A/A With Red Dye Marker", De-
scriptive Handbook published by New Equipment Training Branch, Picatinny
Arsenal.

2(U) Reference USARV message released subject munitions for operational use
by units who had completed the necessary NETT training but restricted their
use in the close proximity of friendly troops until personnel are qualified
and proficient. The terms qualified, proficient and "close proximity" have
not been clarified to date hence it is considered that a uniform standard
within USARV would be most desirable. As a minimum, employment doctrine
and criteria should be standard within a given command supported by var-
ious aviation elements. Such standardization would give the ground com-
mander a better appreciation for what he can expect from the Flechette
Warhead on a sustained basis regardless of the supporting unit and elim-
inate any apprehensions as to its employment.

3(U) The Flechette warhead represents a somewhat different situation to the
armed helicopter pilot since conventional firing and adjustment procedures
are not readily adaptable to this munition. The Flechette does not provide
a clear pattern of ground impact like an HE or WP warhead with either a
point detonating or variable time fuze, hence the reliable burst on target
method of adjustment is not altogether suitable. The red flare discharged
by the Flechette warhead after 1600 feet of flight only gives the pilot an
indication of the impact area, but cannot identify the beaten zone.

4 (C) In the absence of an appropriate training or technical manual, the NETT
instructional handbook is the most authoritative information on the bal-
listics and lethality of the Flechette Warhead, hence the data and rec-
ommendations developed herein are premised on the accuracy of this hand-
book coupled with the experience of aviators who have fired the munitions.

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Because of the time/distance requirements for the Flechettes to attain and sustain adequate kinetic energy for optimum lethality, the minimum and maximum slant ranges for employment are specified in the handbook as 2000 and 4500 feet respectively. The angle of delivery can vary from ten to forty-five degrees dependent upon the type of target, but for normal surface targets, peak lethality is achieved at the lower delivery angle and lower heights of burst (150-300 feet HOB and 10 degrees dive angle which relate to a slant range of 2200-3000 feet). A tabulation of this data and the beaten zones (lethal area) is as follows:

Delivery Altitude (Ft)	Range (Ft)	HOB (Ft)	Lethal Area	
			Length (Ft)	Width (Ft)
350	2000	120	300	65
530	3000	300	900	224
790	4500	560	1200	465

5.(U) In view of the above delivery and lethality figures, many of the variables associated with Flechette employment can be isolated and treated as constants. In general, firing of the Flechette at a slant range of 3000 feet from an altitude of 530 feet on a dive angle of ten degrees will produce near optimum results. It is recognized that the ranges and altitudes cannot be exact but offer a standard for achievement. With the desired launch data known, the considerations for troop safety and target orientation can be addressed with a greater degree of certainty.

6.(C) The elliptical beaten zone utilizing the above delivery path will be 900 feet (274 meters) long by 224 feet (68 meters) wide. Since the dispersion error of the 2.75" FFAR is approximately 10 mils, this would equate to approximately 300 feet or 91 meters at a range of 3000 feet. The linear dispersion/beaten zone would then be increased to 365 meters while the lateral zone would increase to 159 meters if the dispersion error were assumed to be in a vertical plane. Since the dispersion error would actually become greater when superimposed on the surface at a ten degree angle of attack, it is therefore necessary to add a buffer zone to compensate for this error. Although the probability for range error is greater than for deflection error, a one hundred per cent buffer should be added both laterally and longitudinally thus giving a higher lateral safety margin for fires placed parallel to a friendly forward trace, the preferred delivery technique. These safety buffers now increase the minimum safe distance (MSD) to 730 meters longitudinally and 318 meters laterally when the warhead is launched from a range of 3000 feet. By the same analysis, MSD's for the warhead at its range extremities are included as follows:

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<u>Range (meters)</u>	<u>Minimum Safe Distances</u>	
	<u>Longitudinal (meters)</u>	<u>Lateral (meters)</u>
2000 Ft (610)	991 Ft (302)	525 Ft (160)
3000 Ft (915)	2385 Ft (730)	1043 Ft (318)
4500 Ft (1370)	3288 Ft (1002)	1890 Ft (576)

7.(U) The longitudinal dispersion pattern of the warhead coupled with the greater longitudinal dispersion error of the 2.75" rocket favors delivery of fires parallel to the friendly front. This will normally orient the fire for maximum lethality on the enemy force in a conventional tactical situation. While the restriction against firing over the heads of friendly troops is easily understandable until the warhead has been fully proven, compliance with the longitudinal MSD's and ranges prescribed in paragraph 6 above would preclude the Flechettes ever being released from the warhead case over the heads of friendly troops (considering the 1600 ft. required from launch to release of nose cone). This is an important factor since some tactical dispositions may arise where it will be necessary to strike from altitude over friendly lines or the intensity of enemy fire beyond the forward trace may be such that optimum attitudes and ranges for Flechette delivery may not be attainable parallel to the friendly forces.

8.(U) Based on the foregoing it is recommended that the minimum safe distances prescribed for the 4500 foot range be accepted as the MSD for negligible risk to friendly troops when employing Flechette warheads at any range up to 4500 feet. For purposes of simplification, the longitudinal distance should be 1000 meters and the lateral distance 500 meters. It is recognized that this may be a conservative approach but if these distances are utilized, the target may be struck from almost any angle at a lesser range without actually releasing the rocket over the friendly troops. While the maximum MSD is recommended for routine support, the median or optimum range (3000 ft) MSD is far more realistic and should be considered for application when friendly troops are in protected positions (foxholes, bunkers, etc.). The minimum range MSD represents a marginal situation and should not be utilized unless the ground commander is willing to accept a high risk of injury to friendly troops. Such should normally only be the case in true tactical emergencies.

9.(U) The rationale behind the selection of the higher MSD is to compensate for range error on the part of the aviator and the ground commander. This represents a reasonable MSD while not losing the objectivity of initiating employment of the Flechette in support of ground troops and represents a point of departure from which experience will breed proficiency and confidence on both sides. It is considered essential however, that aviators become more conscious of ranges and estimation when

employing the warhead. As this capability increases, it would not be unrealistic and would be most desirable to use the 300 meter lateral MSD with negligible risk to ground troops. This reduction can become a reality after operational experience is gained at the greater distance and proficiency is confirmed through employment.

10.(U) Recommendations:

a. A minimum safe distance for employment of the Flechette warhead in the proximity of friendly forces be prescribed as 1000 meters longitudinally and 500 meters laterally.

b. In fixed position defenses where friendly forces have deliberate cover, the MSD for Flechette employment should be 700 meters longitudinally and 300 meters laterally.

c. That US Army Weapons Command be queried as to the final test results and total reliability of the WDU 4A/A warhead and a recommended minimum MSD for its employment in the proximity of friendly forces.

UNCLASSIFIED

Security Classification

DOCUMENT CONTROL DATA - R & D

(Security classification of title, body of abstract and indexing annotation must be entered when the overall report is classified)

1. ORIGINATING ACTIVITY (Corporate author)		22. REPORT SECURITY CLASSIFICATION	
HQ, OACSFOR, DA, Washington, D.C. 20310		Confidential	
3. REPORT TITLE		23. GROUP	
Operational Report - Lessons Learned, Hq, 145th Combat Aviation Battalion		4	
4. DESCRIPTIVE NOTES (Type of report and inclusive dates)			
Experiences of unit engaged in counterinsurgency operations, 1 Nov 68 to 31 Jan 69			
5. AUTHOR(S) (First name, middle initial, last name)			
CO, 145th Combat Aviation Battalion			
6. REPORT DATE		74. TOTAL NO. OF PAGES	75. NO. OF REFS
12 February 1969		30	
6a. CONTRACT OR GRANT NO.		6b. ORIGINATOR'S REPORT NUMBER(S)	
b. PROJECT NO.		691153	
c. N/A		6c. OTHER REPORT NO(S) (Any other numbers that may be assigned this report)	
d.			
10. DISTRIBUTION STATEMENT			
11. SUPPLEMENTARY NOTES		12. SPONSORING MILITARY ACTIVITY	
N/A		OACSFOR, DA, Washington, D.C. 20310	
13. ABSTRACT			