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AAP-3-bwz
3 November 1966

POINT PAPER

Subj: I Corps Estimate, Helicopter Requirements

1. Helicopter requirements represent a composite of a number of variables since the versatility of the helicopter enables it to perform a wide variety of functions.
2. Statistical data of helicopters support performed for III MAF in RVN indicates that the transport helicopters sorties average approximately 32,000 UH34 equivalent sorties per month. These sorties are allocated to five main functional areas as follows:

Combat troop and cargo sorties	38%
Logistic troop and cargo sorties	30%
Evacuation sorties	12%
Administrative sorties	17%
Other (SAR-Trng-Maintenance, etc.)	5%
	<u>100%</u>

3. An analysis of the functions allocated indicates the committed battalions require all of the combat and evacuation sorties and half of the administrative sorties for 71 percent of the total sorties, while security battalions require 29 percent of the sorties by function. Translated to sortie rates, a committed battalion required 2,250 sorties/month as compared to 1,160 sorties/month for security forces.
4. CINCPAC CY 1966 and 1967 adjusted requirements indicate the need for four additional squadrons or a 57 percent increase in units.
5. An adjusted rate to reflect additional CINCPAC requirements is as follows:

Security Bns	1800 sor/mo*
Committed Bns	3500 sor/mo*

*UH34 equivalent

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6. Eight battalions are estimated to be required on a continuing basis in a security role. The assignment of 28 battalions in I Corps would therefore require sorties as follows:

8 Bns Security @ 1800 sor/mo	14,400
20 Bns Committed @ 3500 sor/mo	70,000
Total sor/mo	84,400*

*UH34 equivalent

7. Helicopter forces to meet a given requirement are based on both experience and anticipated performance factors as follows:

<u>Model</u>	<u>% Available</u>	<u>Sorties/ Month</u>	<u>Sorties Equivalent</u>
UH34	70%	205	1
CH46	70%	165	1.7
CH53	70%	150	3

8. Employing the above factors, the numbers of aircraft and resulting force levels may be developed from the following formula:

No. Helos x % Avail x Sor/Mo x Sortie Equivalent = Total sorties

9. Use of the above formula offers the following three alternatives to support 28 infantry battalions requiring 84,400 UH34 equivalent sorties/month.

Alternative 1: All UH34 Model Helicopters

UH34 x 70% x 205 x 1 = 84,400
UH34 = 590 or 25 squadrons

Alternative 2: All Helicopters are CH46

CH46 x 70% x 165 x 1.7 = 84,400
CH46 = 430 or 18 squadrons

Alternative 3: CH46/CH53/UH34 Mix

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8 SQDNS CH46 $182 \times 70\% \times 165 \times 1.7 = 37,700$ UH34 Sor equivalent7 SQDNS UH34 $168 \times 70\% \times 205 \times 1 = 24,000$ UH34 Sor equivalent3 SQDNS CH53 $72 \times 70\% \times 150 \times 3 = 22,500$ UH34 Sor equivalent

18 Sqdns/422 Helos

Total 84,200 UH34 Equivalent sorties

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AAP-2-buc
7 October 1968POINT PAPER

Subj: Helicopter Shortage Situation and Requirements

1. The programmed Marine Corps division/wing team structure provides one helicopter group consisting of five medium transport, a heavy transport, and an observation squadron to each division/wing team. The assignment of helicopter squadrons to Marine forces in Southeast Asia based on this structure would be 10 medium transport, 2 heavy transport and 2 observation squadrons for support of the two divisions of III MAF.
2. The operational objective of the Marine Corps force structure in helicopter troop support is the simultaneous landing of the assault elements of two divisions (5500 troops and 425 short tons per division) within 30-90 minutes at a radius of 50 nautical miles. The assignment of helicopter squadrons to Southeast Asia based on this operational objective would be the total Marine Corps helicopter assets of 15 medium transport, (all CH-46) 3 heavy transport (all CH53) and 3 observation squadrons.
3. The build up in helicopter transport forces to meet the operational objective has been in progress for several years and is shown as follows:

<u>Year (FY)</u>	<u>1961</u>	<u>1962</u>	<u>1963</u>	<u>1964</u>	<u>1965</u>	<u>1966</u>	<u>1967</u>
Sqd	12	13	14	15	17	18	20*
Helos	288	312	336	360	408	432	480*

* Two squadrons represent add-on for III MAF not previously programmed.

4. III MAF requirements for support of two Marine Divisions (18 infantry battalions) as established by CINCPAC CY 1966 Adjusted Requirements and CY 1967 Requirement of 18 June 1966, are:

10 Medium Helicopter Squadrons
1 Heavy Helicopter Squadron
4 Observation Squadrons

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5. TAB A contains a comparison of III MAF CY 1967 helicopter requirements and current and planned capabilities in terms of troop, cargo and battalion lift equivalents. This deficiency is offset to some degree by the availability of one medium squadron aboard the SLF which can assist in large scale operations, and one medium helicopter squadron in Okinawa which could be deployed to South Vietnam in an emergency.

6. TAB B contains a comparison of the Army Airmobile Division troop lift capability and III MAF helicopter requirements and capabilities in terms of division equivalents. To obtain a direct comparison computations were based on maximum seat capacity of transport helicopters. It is assumed that airmobile division lift capabilities as well as Marine would be degraded to about 60 percent of maximum seat capacity under conditions in South Vietnam unless operated at overload capability.

7. TAB C is a comparison of U. S. Army and U. S. Marine Corps helicopter sorties, losses and loss rates for the period October 1965 - August 1966.

8. Further increase in helicopter lift capability of III MAF beyond that planned through April 1967 will not be feasible in CY 1967.

9. At present nine of the Marine Corps total of 15 medium helicopter squadrons are deployed to WestPac. Although sufficient UH-34s to form two more medium helicopter squadrons will become available in CY 1967 as a result of CH-43 transitions, current helicopter pilot training rates will not support an increase in the helicopter forces scheduled for commitment to Southeast Asia. TAB D contains the helicopter requirements and availability at end FY 1967.

10. Acceleration of scheduled replacement of UH-34 squadrons with CH-43 squadrons to increase lift capability is not possible due to a shortage of spare parts for the CH-43 which will persist through CY 1967. The Chief of Naval Material and the Aviation Supply Office estimate that only four of a planned five CH-43A replacement squadrons can be supported in WestPac through July 1967, and then only under the following conditions:

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a. A slow build up to a programmed utilization of 70 hours/month/helicopter is acceptable.

b. CONUS utilization is limited to 40 hours per month/helicopter.

c. Further LPH outfitting for CH-46A support is deferred.

SUMMARY: The Marine Corps has recognized the advantages of mobility inherent in the helicopter for many years. A force objective was developed and a gradual build up to achieve the objective has occurred since 1961.

III MAF requires 11 transport helicopter squadrons and four observation squadrons for support of I Corps operations of two Marine Divisions in CY 1967. The Marine Corps concurs in this requirement but can provide and sustain only eight transport and three observation helicopter squadrons for III MAF in CY 1967.

The III MAF requirement for 11 transport helicopter squadrons is one less than the normal division/wing team structure. However, the capability to mass helicopters in support of either division justifies a reduction in the lift capacity normally assigned for separate divisions.

III MAF helicopter lift capability per division is substantially less than the normal capability allocated to an Army Airmobile Division. However, massing of III MAF helicopters in support of one division would provide a lift capability that exceeds the airmobile division.

The III MAF helicopter loss rate exceeds that of the Army.

A 50 percent increase in current III MAF helicopter lift capability is planned during FY 1967 through:

(1) Replacement of one UH-34 squadrons by CH-46 squadrons by January 1967.

(2) Addition of one Heavy Helicopter Squadron--CH-53 in April 1967.

(3) Higher availability of CH-46A helicopters through improved supply support.

Further increase in lift capability is not feasible in CY 1967 with present helicopter pilot resources.

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COMPARISON OF III MAF HELICOPTER REQUIREMENTS/CAPABILITIES

III MAF/CINC PAC CY 1967 Requirements	Current Capabilities III MAF	Planned April 67 Capability for III MAF	DEFICIENCY	
			Current Capacity vs. CY 1967 Requirement	Planned Capacity vs. CY 1967 Requirement
10 HMM 120 UH34D 120 CH46A	7 HMM 96 UH34D 72 CH46A	7 HMM 72 UH34D 96 CH46A	3 HMM 48 CH46 1 UH34	3 HMM 40 UH34 24 CH46
1 HMH 24 CH53	DET HMH 12 CH37	1 HMH 24 CH53	1 HMH 21 CH53	
4 VMO 96 UH1E	2 VMO 47 UH1E	3 VMO 72 UH1E	2 VMO 48 UH1E	1 VMO 24 UH1E
Troop Capacity	2883	1502	2214	(1381) (668)
Cargo (Tons)	358T	219T	272T	(139T) (59T)
Battalion Lift Capability	4 INF Bn & 1 CO	2 INF Bn	3 INF Bn & 1 CO	2 INF Bn & 1CO 1 INF Bn

Note 1/ Lift capacity in terms of battalions. Simultaneous lift of assault elements (3 companies) of battalion over distance of 25 miles. Battalion closes in 1 hour.

Note 2/ The troop and cargo capacity of the helicopter has been adjusted to account for:

- (a) Helicopter armament, armor and ammunition.
- (b) Temperature and humidity conditions normally encountered in Vietnam.
- (c) The average number of helicopters in commission based on experience.

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TAB A

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COMPARISON OF ARMY AIRMOBILE DIVISION WITH III MAF
REQUIREMENTS/CAPABILITIES PER DIVISION

	Army Airmobile Division	III MAF Current Capability per Division	III MAF Planned Capability Apr 67 per Division	III MAF/CINCPAC CY-67 Requirements per Marine Division
Aircraft	176 UH1D 48 CH-47 111 UH-1B (Armed helo for escort and suppressive fire) 93 OH6 (Observation)	48 UH-34 36 CH-40 6 CH-37 23 UH1E (Observa- tion and fire suppression)	36 UH-34 48 CH-46 12 CH-53 36 UH1E (Observation and fire suppression)	60 UH-34 60 CH-46 12 CH-53 48 UH1E (Observation and fire suppressio
Troop Lift Capability	3520	1502	2088	2676
Percent	100%	43%	60%	76%

Note 1/ Troop Lift Capability Reflects the Maximum Seat Capacity of Transport Helicopters

Note 2/ Massing of III MAF Helos provides approximately 17% more lift in support of one Division than that assigned to the Airmobile Division.

TAB B

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HELICOPTER LOSS COMPARISON*

U. S. Army and USMC
Oct 1965 - Aug 1966

	<u>SORTIES</u>	<u>LOSSES</u>		
		<u>Combat</u>	<u>Operational</u>	<u>Total</u>
USA	1,899,763	106	103	209
USMC	360,268	28	13	41

<u>RATE:</u>	<u>USA</u>	<u>USMC</u>
Combat	1 loss/17,922 sorties	1 loss/12,867 sorties
Total	1 loss/ 9,090 sorties	1 loss/ 8,787 sorties

* Does not include losses due to ground attack.

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TAB C

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AAP-3-bwz
14 September 1966

HELICOPTERS REQUIRED/AVAILABLE END FY 1967

1. Helicopter required and available at end FY 1967 is shown in paragraph 2 below. The force level on which the requirements are based is as follows:

	<u>Total</u>	<u>WestPac</u>
HMM -	17	9
HMH -	3	1
HMMT -	2	-
VMO -	5	3

<u>TYPE</u>	<u>WESTPAC Req/Avail</u>	<u>CONUS Req/Avail</u>	<u>TOTAL Req/Avail</u>
CH46	96/96	120/109	216/205
UH34	138/134	120/126	258/260
CH53	24/24	48/42	72/86
UH1E	72/72	34/64	106/116
Total			649/667
			718

TAB D

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111-8-500
15 December 1966POINT PAPER

Subj: Helicopter to Infantry Ratio (Item 11-3)

1. Present Helicopter/Infantry Levels and Adequacy of This Level

1. Present ratio:

	<u>Infantry Bns</u>	<u>Helicopter Sqs</u>
Total Marine Corps	27	15 HMM 2 HMM 3 VMO
Westpac	15	8 HMM 1/2 HMM 2 VMO
Vietnam	12	6* HMM 1/2 HMM 2 VMO
Okinawa	2	1 HMM
Special Landing Force	1	1 HMM

* 4 HMM in support of III MAF
1 HMM in support of RVN
1 HMM in support of U. S. Army

2. Adequacy of helicopter/infantry ratio.

a. Marine Corps Program. Vertical assault capability which will provide as a minimum, initial lift for the landing of the assault elements of two RLIs (4 BLTs) in each FMB, a distance of 60 miles radius within 60 - 90 minutes and which will provide the mobility and logistic support to forces ashore. The present fleet modernized with the CH46 helicopter and the CH53 helicopter. All three heavy squadrons modernized with the CH53 helicopter are programmed to provide the required capability.

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b. Vietnam. One of the six HMMs in Vietnam is assigned primary support in I Corps to Vietnamese forces and one squadron is assigned to Army forces in II Corps. A seventh squadron operates with the LPH based special landing force along the coast of Vietnam. Four HMM are in direct support of 12 Marine Infantry Battalions in Vietnam.

c. Projected Force Level Vietnam. Marine Infantry Battalions in Vietnam are expected to increase from 12 to 18. One additional helicopter squadron will be introduced and the squadron supporting the U. S. Army is expected to be returned to Marine Corps control.

d. The versatility of the helicopter makes it doubtful that there will ever be enough to meet the desires of all potential users. However, Marine Corps doctrine provides for centralized control of its helicopters. Such control permits careful evaluation of priority of employment and enables massing of resources when required to carry out specific objectives. It is our judgment that the force level ratio of helicopter squadrons to infantry battalions in Vietnam is reasonable considering other commitments in the Atlantic and our ability to provide a training and rotation base. Our capability will improve as equipment modernization progresses and units otherwise committed are returned to Marine Corps control.

B. Unique Characteristics of Vietnam Situation

1. A large percentage of the roads in Vietnam are cut by the Viet Cong. This is particularly true of secondary roads serving district towns and outlying posts. The supply, support and command of substantial forces at this level and the routine process of government are dependent upon the helicopter.

2. Offensive operations against Viet Cong bases and forces depend primarily on helicopters for surprise and speed of movement as well as the capability to surround or operate in the rear of Viet Cong formations.

3. The Viet Cong employ their classic tactic of striking a remote outpost or town followed by ambushes of relieving units forces at the likely helicopter landing zones. The introduction of relief forces must therefore be introduced quickly and in sufficient strength to insure combat integrity of the force and to avoid piecemeal destruction of the force resulting from a slow buildup such as occurred to a Vietnamese Battalion (1/7) north of Dong Xoai.

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C. Types of Helicopter Missions in Vietnam

1. Troop transport.
2. Supply of U. S. and ARVN forces.
3. Evacuation of casualties.
4. Evacuation of troops from untenable positions (withdrawal).
5. Recovery of disabled helicopters.
6. Communications wire laying.
7. Day and night reconnaissance.
8. Gunfire spotting.
9. Command and control vehicle.
10. Search and rescue.
11. Radio relay.
12. Armed escort for transport helicopters.
13. Fire suppression in and around the helicopter landing zones.

D. Carrier vs. Land Based Helicopters

1. Advantages:

a. Flexibility. An LPH with its embarked helicopters and landing force provides a highly mobile reserve with a potential for assault or raid anywhere along the coast in a minimum of time.

b. Maintenance. As a maintenance base the LPH obtains facilities for repair and protected working areas otherwise not available in an expeditionary environment.

c. Security. In a Vietnam type environment, the LPH offers a base that is almost completely free from sabotage and infiltration.

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d. Casualty Evacuation. The LPH offers a well equipped and secure evacuation base for casualties.

2. Disadvantages:

a. Extending Lines of Communication. As the area of operations expand and the supported forces move inland, the distance becomes too great to permit timely and adequate response by the supporting helicopters.

b. Responsiveness. Land based helicopters are more responsive to the requirements of the landing force since they are in closer proximity to and directly under the command and control of the Landing Force Commander. The direct response achieved while land based is diluted to some extent while LPH based because of additional considerations inherent in the smaller landing platform, the more complex operations aboard a carrier, and the occasional requirements for the LPH to further deploy or maneuver away from the area of landing force operations.

B. Vulnerability of Helicopters and Losses Thus Far Experienced

1. Helicopter losses:

<u>Period</u>	<u>Type</u>	<u>Avg No. helos</u>	<u>Losses</u>	
			<u>Combat</u>	<u>Operational</u>
1962	UH34	24	4	2
1963	UH34	24	1	8
1964	UH34	24	2	5
1965	UH34	54	3	4
(Jan-Jun)	UH1E	3	-	-
1965	UH34	142	1	0
(Jul-Sep)	UH1E	19	-	-
	CH37	3	-	-
1965				
Oct	UH34	144	6	2
	UH1E	30	13	-
	CH37	6	-	-

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<u>Period</u>	<u>Type</u>	<u>/ av No. helos</u>	<u>Combat / Operational</u>	
1965				
Nov	UH34	144	2	1
	UH1E	36	-	1
	CH37	5	1	-
Dec	UH34	144	1	-
	UH1E	36	-	1
	CH37	5	-	-
Total by Type	UH34	-	13	29
	UH1E	-	13	2
	CH37	-	1	-
Total helos			<u>30</u>	<u>31</u>

2. Vulnerability of helicopters. The October - November period includes the loss of six UH34Ds and 13 UH1Es on the ground at Marble Mountain. The CH37 was destroyed by an enemy grenade after a forced landing. The remaining two helicopter losses from combat causes are associated with the following statistics:

<u>Total Hours</u>	<u>Sorties</u>	<u>Helos hit</u>	<u>Hits on Helos</u>	<u>Losses</u>
18,027	45,419	100	226	2

The above record indicates that helicopters are hit on the average of once every 180 hours or once every 454 sorties.

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REF ID: A66111

MA 4-8-67

CINCPACAF

Subj: Helicopter Shortage Situation and Requirements

1. The programmed Marine Corps division/wing team structure provides one helicopter group consisting of five medium transport, a heavy transport and an observation squadron to each division/wing team. The assignment of helicopter squadrons to Marine forces in Southeast Asia based on this structure would be 10 medium transport, 2 heavy transport and 4 observation squadrons for support of the two divisions of III MAF.

2. III MAF requirements for support of two Marine Divisions (16 infantry battalions) as established by CINCPAC CY 1966 Adjusted Requirements and CY 1967 Requirement of 15 June 1966, are:

- 10 Medium Helicopter Squadrons
- 1 Heavy Helicopter Squadron
- 4 Observation Squadrons

3. TAB A contains a comparison of III MAF CY67 helicopter requirements and current and planned capabilities in terms of troop, cargo and battalion lift equivalents. Current helicopter lift capabilities of III MAF as shown in TAB A are approximately 50 percent of stated CY 1967 requirements. Although III MAF helicopter lift capability will be increased approximately one-half by April 1967, it will still be deficient in battalion lift capability equivalent to one battalion. This deficiency is caused to some degree by the availability of one medium squadron aboard the OLF which can assist in large scale operations, and one medium helicopter squadron in Okinawa which could be deployed to South Vietnam in an emergency.

4. Further increase in helicopter lift capability of III MAF beyond that planned through April 1967 will not be feasible in CY 1967.

5. At present nine of the Marine Corps total of 10 medium helicopter squadrons are deployed to Vietnam. Although sufficient OH-34s to form two more medium helicopter squadrons will become available in CY 1967 as a result of OH-34 transitions, current helicopter pilot training rates will not support an increase in the helicopter forces scheduled for commitment to Southeast Asia. TAB B contains the helicopter requirements and availability at end FY 1967.

6. Acceleration of scheduled replacement of OH-34 squadrons with OH-10 squadrons to increase lift capability is not possible due to a shortage of

spare parts for the CH-46 which will persist through CY 1967. Sand erosion of engines and rotor blades has caused spare parts usage far exceeding that anticipated. The Chief of Naval Material and the Naval Supply Office estimate that only four of a planned five CH-46 replacement squadrons can be supported in WestPac through July 1967, and then only under the following conditions:

- a. A slow buildup to a programmed utilization of 70 hours/month/helicopter is acceptable.
- b. CCAUS utilization is limited to 40 hours per month/helicopter.
- c. Further LPH outfitting for CH-46 support is deferred.

SUMMARY: III MAF requires 11 transport helicopter squadrons and four observation squadrons for support of I Corps operations of two Marine Divisions in CY 1967. The Marine Corps concurs in this requirement but can provide and sustain only eight transport and three observation helicopter squadrons for III MAF in CY 1967.

The III MAF requirement for 11 transport helicopter squadrons is one less than the normal division/wing team structure. However, the capability to mass helicopters in support of either division justifies a reduction in the lift capacity normally assigned for separate divisions.

A 50 percent increase in current III MAF helicopter lift capability is planned during CY 1967 through:

- (1) Replacement of two MH-34 squadrons by CH-46 squadrons by January 1967.
- (2) Addition of one Heavy Helicopter Squadron - CH-53 in April 1967.
- (3) Higher availability of CH-46 helicopters through improved supply support.

Further increase in lift capability is not feasible in CY 1967 with present helicopter pilot resources.

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AFB-3-dws
14 September 1966

HELICOPTERS REQUIRED/AVAILABLE END FY 1967

1. Helicopter required and available at end FY 1967 is shown in paragraph 2 below. The force level on which the requirements are based is as follows:

	<u>Total</u>	<u>WestPac</u>
HMM -	17	9
HMH -	3	1
HMMT -	2	-
VMC -	5	3

2.

<u>TYPE</u>	<u>WESTPAC Req/Avail</u>	<u>COMUS Req/Avail</u>	<u>TOTAL Req/Avail</u>
CH46	96/ 96	120/103	216/205
UH34	138/134	120/126	258/260
CH53	24/ 24	48/ 42	72/ 86
UH1E	72/ 72	34/ 64	106/116
Total			649/667 /18

TAB D

AAP-3C-bwz

DEPUTY CHIEF OF STAFF (AIR) COMMENT on Director of Information
Route Slip of 27 Apr 1967

**Subj: Prepared questions and answers for SecNav, Jacksonville,
Florida**

**1. The following is in response to Question 7 of proposed questions
for SecNav visit to Jacksonville, Florida.**

**Question 7. Why does the Marine Corps have fewer helicopters
per maneuver element in Vietnam than the Army?
Is the helicopter allowance going to be increased?
If so, by how much and how soon?**

**Answer: The Marine force structure is planned for amphibious
operations from the deck space of helicopter carriers. Because
of the confined space aboard ship, maximum use must be made of
each helicopter's capability. For this reason, Marine doctrine
has been to operate with larger capacity helicopters in fewer
numbers than the Army.**

**The helicopter allowance in Vietnam will shortly be increased
with the deployment of a heavy transport squadron and remaining
elements of an observation squadron. This increase will amount
to troop lift capacity increase of over 20 percent. Further increases
in capacities will occur as older helicopters are replaced with
larger capacity models.**

**Orig by:
Maj Garcia
28 April 1967
Zegen, RS 4-290**

AAP-3C-owz

DEPUTY CHIEF OF STAFF (AIR) COMMENT on Press Query 181-67
of 26 April 1967

1. Marine helicopters in Vietnam while fewer in numbers than Army helicopters, have on the average one-third greater troop lift capacity per transport helicopter. The Marine program for improving helicopter capabilities is to replace older helicopters on a one-for-one basis with new craft of twice the lift capability rather than major increases in numbers. This program, proceeding on schedule, is based on requirements to develop maximum lift capacity from the confined deck space of the helicopter carriers during amphibious operations. Large numbers of small helicopters are far less efficient in deck space utilization.
2. Figures of troops "in the field" are not available at this Headquarters. Based on the ratio of helicopters to total troop strength, the Marine Corps possesses one helicopter per 310 men, while the Army possesses one per 156 men. This would indicate that the Marine Corps employs a higher percentage of their strength "in the field," since the reported ratios were one helicopter per 15 Army troops and one per 65 Marines.
3. Marine helicopter allowance and capability in Vietnam will shortly increase with the deployment of a heavy helicopter squadron and remaining elements of an observation squadron. Troop carrying capacity will be increased by over 20 percent, with evacuation capabilities likewise increasing. As older helicopters are replaced by new, greater capacity craft, the Marine capability will further increase.

Orig by:
Maj Garcia
28 April 1967
Zegen

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