PROJECT CHECO SOUTHEAST ASIA REPORT

JAN-JUN '67

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PROJECT CHECO REPORT

Contemporary Historical Evaluation of Combat Operations

THE WAR IN VIETNAM

JANUARY-JUNE 1967

29 APRIL 1968

HQ PACAF

Directorate, Tactical Evaluation
CHECO Division

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Project CHECO 7th AF, DOAC

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Project CHECO was established in 1962 to document and analyze air operations in Southeast Asia. Over the years the meaning of the acronym changed several times to reflect the escalation of operations: Current Historical Evaluation of Counterinsurgency Operations, Contemporary Historical Evaluation of Combat Operations and Contemporary Historical Examination of Current Operations. Project CHECO and other U. S. Air Force Historical study programs provided the Air Force with timely and lasting corporate insights into operational, conceptual and doctrinal lessons from the war in SEA.

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FOR THE COMMANDER IN CHIEF

Edward C. Burtenshaw

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Chief, CHECO Division
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AFXOSN ..... 1 Cy
AFXOPR ..... 1 Cy
AFXOPH ..... 1 Cy
AFXPD ..... 9 Cys
AFXDOC ..... 1 Cy
AFXDOD ..... 1 Cy
AFXDOL ..... 1 Cy
SAFOI ..... 2 Cys
SAFLL ..... 1 Cy
SAFAA ..... 1 Cy

MAJCOM

AU (ASI-HA) ..... 2 Cys
AU (ASI-ASAD) ..... 1 Cy
AU (AUL3T-66-7) ... 1 Cy
AU (ACSC) ..... 1 Cy
ADC (ADODC) ..... 1 Cy
ADC (ADOOP) ..... 2 Cys
ADC (ADLPP) ..... 2 Cys
TAC (DO-O) ..... 1 Cy
TAC (DPL) ..... 2 Cys
TAC (DOTS) ..... 1 Cy
TAC (DORQ) ..... 1 Cy
TAC (DI) ..... 1 Cy
MAC (MAFOI) ..... 1 Cy
MAC (MAODC) ..... 1 Cy
MAC (MAOCO) ..... 1 Cy
MAC (MAXDC) ..... 1 Cy
AFSC (SCL) ..... 8 Cys
AFSC (SCO) ..... 2 Cys
AFLC (MCO) ..... 1 Cy
AFLC (MCF) ..... 1 Cy
ATC (ATXDC) ..... 1 Cy
SAC (DO) ..... 1 Cy
SAC (DPL) ..... 1 Cy
SAC (DXI) ..... 1 Cy
SAC (SCIH) ..... 1 Cy
SAC (OA) ..... 1 Cy
USAFA (OI) ..... 1 Cy
USAFA (DFH) ..... 1 Cy
USAFE (OPL) ..... 2 Cys
USAFSO (NDI) ..... 1 Cy
USAFSO (BIOH) ..... 1 Cy
USAFSS (ODC) ..... 2 Cys

OTHERS

9AF (DO) ..... 1 Cy
12AF (DI) ..... 1 Cy
19AF (DA-C) ..... 1 Cy
USAFAGOS ..... 1 Cy
USAFSAWC (DO) ..... 1 Cy
USAFTAWC (DA) ..... 1 Cy
USAFTARC (DI) ..... 1 Cy
USAFTALC (DA) ..... 1 Cy
USAFTFWC (CRCD) ... 1 Cy
FTD (TDPI) ..... 1 Cy
AFAITC ..... 1 Cy
SRAFREP (SWC) ..... 1 Cy

PACAF

C ..... 1 Cy
DOP ..... 1 Cy
DP ..... 1 Cy
DI ..... 1 Cy
DO ..... 1 Cy
DM ..... 1 Cy
DPL ..... 1 Cy
IG ..... 1 Cy
DXIH ..... 1 Cy
5AF (DOP) ..... 1 Cy
13AF (DOP) ..... 1 Cy
6400 TEST SQ ..... 2 Cys
7AF (DOAC) ..... 9 Cys
DTEC ..... 3 Cys

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FOREWORD

"The War in Vietnam" provides an overall look at the Southeast Asia situation, as it relates to the role of the United States Air Force. Intensifying its air operations, the USAF increased its close air support, interdiction, fixed-wing, and helicopter support. New tactics were also used to improve the Search and Rescue capability in highly defended areas and measures were devised to minimize limitations of aircraft in recovering downed airmen.

In an effort to exhaust enemy resources and remove his sanctuaries in North Vietnam, one of the major objectives of the air campaign was greater targeting freedom. A probing for target alternatives showed destruction of hard-to-replace vehicles could be more effective than "cratering a road, interdicting a rail line, or destroying a bridge."

Since enemy strategy emphasized prolonging the war by keeping the U.S. out of the Hanoi/Haiphong region, CINCPAC enumerated methods of attacking his air defense system, including MIG air bases and aircraft on the ground.

CHAPTER I

PLANS AND POLICIES

Enemy Strategy

In assessing the enemy situation in January 1967, the Commander, U.S. Military Assistance Command, Vietnam (COMUSMACV), recognized the unchanging strategy of Gen. Nguyen Giap: "Strike to win, strike only when success is certain--if it is not, don't strike."

After a series of defeats in South Vietnam (SVN) in 1966, the enemy was avoiding large-scale confrontations, but there were no indications that he had dispersed his main forces and was reverting to strictly guerrilla-level warfare. More likely, he was fighting defensively, when forced to do so, and taking advantage of his sanctuaries, until his men were sufficiently well-trained and equipped to launch attacks of his choosing. 1/

There was evidence, however, that after entry of substantial U.S. and Free World Military Assistance Forces (FWMAF) into South Vietnam, the enemy had developed a new strategy. It emphasized continued reinforcement from North Vietnam across the DMZ, but mainly through Laos. Reaffirming the need for a protracted war, it also stressed the need to seize and create new opportunities for decisive tactical victories of highest impact in a relatively short time.

Simultaneously, it stressed intensified guerrilla action and public disturbances. 2/

The enemy's principal objective appeared to be in the highlands, with

Quang Tri and Thua Thien in I Corps, and the coastal provinces of II Corps as secondary objectives. Saigon remained the ultimate objective. The enemy's strategy in attempting to pin down forces in coastal areas to divert attention from the highlands had thus far been unsuccessful. By concentrating two divisions in Cambodia (west of Pleiku and Kontum Provinces), however, he had forced the U.S. to deploy a minimum of four U.S. battalions to the highlands to provide surveillance over border areas. The enemy had adopted a similar strategy in III Corps area, and in the Delta area, the enemy continued to use guerrilla forces. 3/

U.S. Objectives

After assessing operations of 1966, CINCPAC profiled 1967 goals and military strategy to accomplish U.S. objectives for Vietnam. Involving three interdependent undertakings, this strategy formed an integrated concept of conducting operations against North Vietnam, Laos, and South Vietnam, as follows: 4/

* Take the war to the enemy in the North by unremitting but selective application of U.S. air and naval power.
* Expand offensive military operations in South Vietnam to seek and destroy Communist forces and infrastructures.
* Extend secure areas of South Vietnam by civil-military operations and provide assistance to the GVN in building an independent, viable, noncommunist society.

The objective of ROLLING THUNDER operations was to apply steadily increasing pressure against North Vietnam to cause Hanoi to cease its support of aggression in the South, while making continued support increasingly difficult and costly. This would be accomplished by:

1. Reducing or denying external assistance to North Vietnam;

2. Disrupting and destroying its war-making or war-supporting resources;

3. Disrupting and impeding movement of men and material to Laos and South Vietnam.

Except for POL strikes, CINCPAC concluded little had been done to reduce or deny external assistance to NVN. With respect to destroying the country's war making potential, only minor progress had been accomplished. Out of 104 numbered targets located in the northeast, only 20 had been hit in 1966. Primary emphasis had been placed on interdiction, but the enemy had proved extremely resourceful in hiding and dispersing his logistic activity and had demonstrated remarkable recuperative capabilities. In the 1966 ROLLING THUNDER campaign, adequate and steady pressure had not been applied against the enemy, and restrictions had resulted in inefficient use of airpower. 5/

In CINCPAC's opinion, the basic objective and tasks for ROLLING THUNDER remained valid for 1967. Continuation of this program, together with successful operations in South Vietnam, offered the best prospect of bringing the war to a conclusion that would be advantageous to the U.S. and its allies. He, therefore, outlined a concept for ROLLING THUNDER operations, which emphasized attacks against target systems as opposed to individual strikes against only a small part of any given capability. It was designed to disrupt and destroy in depth those resources which contributed most to the support of aggression. The concept was not necessarily designed to totally destroy any designated system, but to cause broad disruption which would have important

military, economic, and psychological effects. [6]

While the U.S. had full initiative and control in the air campaign in North Vietnam, the enemy was able to pace the ground war to his advantage in the South. Although the U.S. had taken the initiative against main force units, the enemy could disengage many of them almost at will and flee to their sanctuaries in Laos, Cambodia, and North Vietnam. The objective during 1967 would be to defeat the Viet Cong/North Vietnamese (VC/NVA) main force units, destroy enemy base areas and resources, and drive him into thinly populated areas where food was scarce. Concurrently, an effort would be made to locate, interdict, and destroy the enemy's ground and water LOCs in the South. CINCPAC also stressed the need to support the government of Vietnam in a vigorous Revolutionary Development Program. In addition, he recommended a hard-hitting psychological campaign to offset the enemy's propaganda campaign, aimed at increasing domestic and international pressure on the U.S. government to withdraw from Vietnam. [7]

Without our effort and sacrifices, CINCPAC believed that SVN would have fallen under communist control, and a similar fate would have been in store for Laos, Cambodia, and Thailand. In his opinion, the most important requirement for success was a demonstrated determination to "stick to our guns." [8]

Anti-Infiltration Operations

In discussing ways of improving the anti-infiltration aspect of the overall military strategy, CINCPAC stated that a well-balanced program of military operations included the objective of countering infiltration, but

without undue reliance on any specific measure. While infiltration could not be stopped entirely by direct military action, it could be made less effective and more costly. The problem was to select the best possible combination of anti-infiltration measures in keeping with U.S. overall strategy, which currently stressed the offensive. 9/

The air interdiction campaign in South Vietnam, Laos, and North Vietnam and offensive ground operations in South Vietnam, had degraded the enemy's supply capability. This may have accounted in part for his attempts to avoid significant contact with our forces. The enemy was dependent upon external sources for most of his weapons, ammunition, medical supplies, and technical equipment. CINCPAC, accordingly, believed the "single most effective and economical method of drastically reducing the enemy's capability to carry on the war in South Vietnam" was closing the Haiphong Port, as well as other ports in NVN. If this took place, however, the enemy would very likely resort to even greater use of Cambodia to infiltrate men and supplies. 10/

Current counter-infiltration programs were therefore aimed to:

- Destroy the enemy's military and logistics base;
- Interdict his LOCs;
- Force the enemy into sustained combat operations;
- Provide security and economic, social, and political development for the SVN population;
- Inhibit the enemy's effective use of Laos and Cambodian sanctuaries.

To improve effectiveness of these anti-infiltration measures, CINCPAC made the following comments and recommendations:

Air Operations

North Vietnam's transportation systems, particularly in Route Packages V and VI, had been seriously damaged or destroyed. These resources would otherwise have been used to support aggression in the South. Furthermore, these attacks had forced Hanoi to expend considerable resources and manpower in repairing and keeping the LOCs open and supplies moving. There was still a need for more effective night operations, and improved intelligence in the southern part of North Vietnam and in Laos. Research and Development (R&D) programs currently underway would help night reconnaissance operations, when they could be made available. Also, if the Muddy Hill (Navy) project proved successful, it would provide an advanced aerial reconnaissance capability for penetrating jungle canopy, under all conditions of light and weather. When available, the air-delivered antipersonnel and antivehicular munitions and sensors promised significant operational improvements. In southern NVN and in Laos, aerial-delivered antipersonnel and antivehicular denial weapons were needed, together with B-52 night attacks and aircraft strikes during the day. Detailed review and selection of more valuable interdiction points were continuing. 11/

Naval Operations

SEA DRAGON forces had been successful in interdicting enemy coastal maritime traffic within present restrictions. The enemy's capability to move bulky cargo by watercraft had been severely limited and he had been forced to use over-taxed land LOCs. Extension of SEA DRAGON operations to 19 degrees N was expected to help tie up the vital Vinh logistics hub, and it was recommended that the interdiction area eventually be expanded

to 20 degrees 30'N. To maintain pressure against enemy logistical capabilities at night and during poor weather, naval shore bombardment against military targets ashore in North Vietnam had been recommended. Game Warden units had started to interdict enemy movement and activity in the Rung Sat Special Zone and major rivers of the Mekong Delta. Their resources were being augmented, and consideration was given to expanding operations in other areas in western RVN. Several steps were also being taken to enhance the capability of Market Time operations, which had been successful in reducing VC infiltration by sea. The convoy control of shipping on the Mekong and Bassac Rivers, established in calendar year (CY) 1966, had proved an effective counterinfiltration measure and must be continued. 12/

Ground Operations

Search and destroy operations continued to seek and destroy the enemy's base area and to locate and interdict enemy ground and water LOCs in SVN. Of predominant interest, several steps were being taken to improve and expand the reconnaissance effort. This planning included use of Army of the Republic of Vietnam (ARVN) ranger battalions in border surveillance, which would serve to free U.S. forces from containment roles, and the introduction of the 9th Infantry Division into the Delta to conduct Riverine operations. Such special operations as SHINING BRASS (Code name for cross-border recon into Laos and DMZ--inactivated 1 Mar 67), had enjoyed considerable success.

Since intelligence was the key to a successful anti-infiltration program, CINCPAC recommended that all restrictions be removed from the SHINING BRASS operation, since there was little doubt that the communists controlled the

area. He also recommended authority be granted to launch special teams into Cambodia, strictly for reconnaissance purposes. Enemy use of bases there for logistical support and Rest and Recreation (R&R), required keeping his units under surveillance when they slipped over the border, so that LOCs could be cut and the units confronted on their return into SVN. Intelligence information concerning personnel and vehicular infiltration was too little and too late. In addition to improving and refining aerial-collection means, measures were also needed to improve ground collection. More military support for CAS programs in Laos, and increased emphasis on prisoner acquisition were also recommendations of CINCPAC. 13/

Sanctuaries in NVN and Laos were limited, since they were subject to restricted air attacks. The Cambodian sanctuary, however, was complete, and its importance as a source of supplies could not be over-emphasized. CINCPAC, therefore, recommended using diplomatic efforts in persuading the Cambodian government to adopt a more neutral attitude so as to inhibit services of this sanctuary. If nonbelligerent political methods did not achieve the required success, "we must be prepared in all respects to use the necessary degree of force to attain our objectives." 14/

Areas of Renewed Emphasis

COMUSMACV noted the tempo of operations had been increasing between December 1966 and May 1967, a period marked by signal success in particular operations. There were certain exceptions, however, to this pattern. Areas which merited Command attention and renewed emphasis were as follows: 15/

1. Night operations had not increased in the same proportion as other indices. Surprise night attacks on installations also suggested inadequate night patrolling. It was imperative to take the night away from the enemy by setting close-in security ambushes and devising other measures.

2. In other than identified enemy base areas, there should be fewer multicompany sweeps and more saturation of large areas with patrols, followed by quick insertion of large units to exploit their finds. Attention to this tactic was desirable for all forces, but especially for ARVN.

3. Aggressive pursuit should be reemphasized; pursuit operations must be commenced rapidly; and must be conducted with determination. All available arms must be fully employed. Commanders must adopt an aggressive attitude toward pursuit and infuse this attitude within all echelons.

4. ARVN forces which, with few exceptions, were underemployed should participate in more combat activity. Extensive use of US/ARVN "Buddy" operations at battalion and company level would contribute to ARVN training and also permit the U.S. to receive better service from them.

5. Pressure should be increased on the enemy logistical system, a weak spot of the enemy main force.

COMUSMACV believed the enemy would try to:

* Regain the initiative in SVN and maintain an overall offensive posture.

* Exact maximum attrition against U.S. and allied forces.

* Create and seize opportunities to trap and kill units in an effort to win victories of high psychological impact.

* Coordinate main forces and irregulars in harassing government and allied installations and forces.

* Intensify guerrilla operations and disrupt revolutionary development.

* Use sanctuaries and remote areas to rest and regroup.

In summarizing efforts of 1966, COMUSMACV stated the command had been engaged much of the time in a holding action, conducting spoiling attacks to disrupt enemy plans, and had now moved into a sustained general offensive. He expected 1967 to be the year in which it would become evident the communists could not win. During this new phase of the conflict, an effort would be made to destroy the enemy, his base areas, rice harvests, and VC infrastructure, as well as interdicting enemy land and water LOCs to keep them open and secure. The enemy must be convinced through U.S. successes and psychological operations that he faced defeat. The principles of mass, surprise, and economy of force would be followed in apportioning resources against the full spectrum of enemy elements. Two important tasks had to be accomplished simultaneously: (1) maintain relentless pressure on enemy combat forces and support systems; and (2) provide expanding security in populated areas. 16/

Assessment of Progress

At the end of April, COMUSMACV assessed the progress achieved: 17/

> *"During the last year and a half we have sought out the enemy, caught him off guard, fought him before he was ready. For a time he stood and fought and we punished him severely. Now he is becoming more difficult to find. We have invaded his elaborate and widely scattered base areas--some of them built over a period of 20 years. Working closely with the Vietnamese forces we have moved into many of the populated and productive areas which formerly provided supplies and recruits to the enemy. We have turned the enemy's ambushes against him and we have learned how to draw him into an ambush. We have sent our deep patrols to find him. He has been punished by*

B-52 strikes and unparalleled close support from our tactical air, artillery and naval gunfire. And on land and sea we have made his infiltration costly."

Although the military picture was favorable, there was no evidence that the enemy was breaking up his major units, or that he had abandoned plans to try to inflict major defeat upon the U.S. Although the enemy was having logistics problems and taking heavy casualties, his leadership remained good and his men were tough and tenacious. While the enemy was discouraged by repeated military defeats, he was encouraged by what he believed to be popular opposition in the U.S. to the Vietnam effort. The communists were determined to continue their aggression from the North, and COMUSMACV stated he could foresee some of the bitterest fighting of the war in the months ahead. 18/

For other indications of substantial progress, there was a steadily increasing number of ralliers. There was also evidence that the Viet Cong were experiencing greater difficulties in recruitment and taxation, in obtaining food and medicine, and in their other manipulations with the population. The NVA were reportedly losing 20 - 25 percent of their personnel from bombing, sickness, disease, and desertion before reaching their destination.

About 10 percent of them, however, recovered from their sickness and completed the trip South, so that the overall infiltration attrition rate was about 15 percent. 19/

COMUSMACV further reported the enemy had been unable to mount a major offensive, although intelligence indicated he had planned doing so in May and

June 1966. He had gained no major victories comparable to his 1965 success in an engagement of battalion-size or larger in more than a year. Since the program to neutralize 41 enemy base areas was initiated in June 1966, there were 14 neutralized by August 1967, and almost all of them had been penetrated or attacked. The number of enemy weapons captured, enemy mortar rounds destroyed, small arms captured or destroyed, and rice captured or destroyed had shown large increases. The enemy-to-friendly killed-in-action ratio increased from 3.2 to 1 in 1966, to 4.1 to 1 during the first six months of 1967, while the weapons gained-to-lost ratio increased from 2.1 to 1 last year, to 3.8 to 1 in the first six months of 1967. 20/

With respect to effectiveness of ROLLING THUNDER operations, a marked increase in time required to repair bridges, marshaling yards, bypasses, etc., indicated labor and material problems. The amount of tonnage requiring transshipment to bypass effects of interdiction on the northeast railroad had dramatically increased during 1967; congestion at Haiphong Port had increased; and the friendly aircraft-loss rate had decreased. 21/

In-country, far more resources were being devoted to pacification efforts, with evident success in the number of people under government versus communist control. Communications and logistics, essential to a healthy economy, were steadily improving. The number of roads open and secure were increasing, and the capability of the Saigon Port had increased dramatically. The Vietnamese Armed Forces also showed encouraging evidence of improvement. Their desertion rate had decreased, the percentage of contacts to total operations was up, and the ratio of weapons lost-to-captured was now favorable. COMUSMACV

wanted all U.S. commanders and advisors to keep their Republic of Vietnam Air Force (RVNAF) counterparts informed of the estimate of progress achieved, as a means of bolstering Vietnamese confidence and esprit de corps. 22/

CHAPTER II

AIR FORCE RESOURCES

Mission

Seventh Air Force (7AF), as the Air Force component command for the U.S. Military Assistance Command, Vietnam, continued to play a vital role in achieving U.S. objectives in SEA. It was involved in three separate but integrated phases of the air war in three different countries. In South Vietnam, the air effort provided support to allied ground forces. In Laos, strikes were aimed at interdicting and disrupting the flow of men and material from North Vietnam into Laos, most of which were ultimately destined for the Viet Cong in South Vietnam. Air operations in North Vietnam, in addition to interdiction, were directed toward destruction of war-making or supporting industrial facilities. The 7AF also had responsibility for assisting, training, and augmenting the Vietnamese Air Force (VNAF). 1/

Resources

To accomplish its varied mission, the 7AF had command in South Vietnam of six fighter wings, the 14th Air Commando Wing, the 460th Tactical Reconnaissance Wing, the 505th Tactical Control Group, the 504th Tactical Air Support Group, and the 834th Air Division with its two wings. It had operational control of three tactical fighter wings, one tactical reconnaissance wing and one air commando wing in Thailand. 2/

The number of operationally-controlled aircraft under 7AF reached a high of 1,354 in January 1967 compared to 1,508 authorized. This increase was due primarily to the addition of C-7A aircraft. The aircraft inventory

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AIRCRAFT UNITS IN THAILAND

INSTALLATION ORGANIZATION	UE
UDORN	
432 TRW	
11 TRS	24 RF-4C
20 TRS	16 RF-101
14 TRS	16 RF-4C
435 TRS	
13 TRS	18 F-4D
555 TFS	18 F-4D
602 FCS	25 A-1
ROT FIS	6 F-102
ROT AEWC SQ	6 EC-121

INSTALLATION ORGANIZATION	UE
NAKHON PHANOM	
56 ACW	
602 FCS	25 A-1
606 FCS	6 C-123
	12 T-28
	12 U-10
	12 A-26
609 ACS	12 A-26
23 TASS	12 O-1
21 HS	12 CH-3

TAKHLI	
355 TFW	
354 TFS	18 F-105
357 TFS	18 F-105
333 TFS	18 F-105
41 TEWS	15 EB-66B
6460 TEWS	13 EB-66B
ROT AREFS (H) (SAC)	10 KC-135

UBON	
8 TFW	
25 TFS	18 F-4D
433 TFS	18 F-4C
435 TFS	18 F-4D
497 TFS	18 F-4C
555 TFS	18 F-4D

DON MUANG	
631 CSG	
ROT FS	4 F-102
ROT TAS	4 C-130

KORAT	
388 TFS	
13 TFS	18 F-105
34 TFS	18 F-105
44 TFS	18 F-105
469 TFS	18 F-105

U-TAPAO	
635 CSG	
ROT AREFS (H) (SAC)	25 KC-135
ROT BS (H) (SAC)	15 B-52

FIGURE 1

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included 652 offense, 22 defense, 147 reconnaissance, 211 airlift, 292 support, and 30 Special Air Warfare aircraft. By June, the number of operationally-controlled aircraft had increased by 26 to 1,380 and the number of authorized aircraft by 36 to 1,544. In January, the 7AF had a total assigned military strength of 42,378, which had increased to 45,139 by June. 3/

Deployment Plans

Deployment plans for 1967 - 1968 were formulated by the Joint Chiefs of Staff (JCS) and the Office of the Secretary of Defense, (OSD) during the latter part of 1966. JCS submitted recommendations calling for 60,600 U.S. Air Force personnel by June 1967 and 63,300 by December 1967. The Defense Secretary reduced these figures to 55,300 by December 1967. He deleted seven USAF tactical fighter squadrons from the JCS deployment plan, and eliminated 136 other fixed-wing aircraft (mostly Air Force) which would have comprised three CV-2 squadrons and eight C-123s (AGIL) for South Vietnam; two C-130 squadrons and 10 EB-66s for Thailand; and 15 AC-47s for South Vietnam and Thailand.

The Defense Secretary invited the services to make adjustments in the deployment "mix", if there were units deleted, which had a higher priority than those approved, and this was subsequently done. The major changes in Program 4, compared with Program 3, which had been issued on 2 July 1966, were extension of the deployment program through Fiscal Year 1968, limiting air munition expenditures to 64,000 tons per month (plus 1,500 tons for training), and increasing the B-52 sortie rate to 800 beginning in February 1967. 4/

In explaining his cuts, the Defense Secretary stated that a stable economy in South Vietnam was essential to unite the population in backing the government. The U.S. Ambassador had asked that U.S. military spending be held to 42 billion piastres in CY 1967 to prevent severe inflation. This program would probably hold price rises to 10 - 25 percent versus 79 - 95 percent in FY 1966. Unless inflation were controlled, civil servants would leave government service, and the Vietnamese Army desertion rate would increase. This would partially cancel effects of increased U.S. deployments; deployment, therefore, had to be fitted to the capacity of the Vietnamese economy to bear this problem without undue inflation. The Defense Secretary believed the Southeast Asia Deployment Program 4 provided budgetary planning consistent with any reasonable hope of economic stability for South Vietnam. 5/

Service chiefs issued strong reclamas to restrictive aspects of Program 4, and JCS informed the Defense Secretary in comparison to the forces requested by them on 4 November 1966, "the forces listed in Program 4 will reduce the military capability to achieve our national objectives and execute our military tasks in SVN." 6/

CINCPAC received information in March that successful implementation of Program 4 depended to a considerable degree on the trade-off concept. Before the 30 June 1968 program completion date, the assumption was that trade-offs could be made to accommodate substitution of units and detachments of higher operational priority than those now deployed, or those included in the balance of this program. Experience in implementing this program had

proved, however, this assumption was of doubtful validity, and as of 9 March 1967, its full implementation was short by 38,241 spaces. Since this figure included spaces for five battalions or equivalents, which could not be considered for trade-off purposes, the number of spaces remaining for possible trade-off action was further reduced. 7/

COMUSMACV stated surveys had been conducted by component commanders to insure that each unit or detachment was productive and necessary, contributed effectively to the overall command mission, or could be reduced in strength or deleted. These surveys aided in achieving maximum utilization of deployed forces, but they had not uncovered areas in which major savings could be realized. 8/

Recapitulation of Program 4, plus spaces included in various reclamas for the Air Force, was as follows: 9/

OSD Accepted Total	55,582
Repair and Engine Maintenance .... (from Clark AB, no base area in SVN initially)	229
Total proposed AF strength	55,811
Total Program 4 strength increase	8,821

Of units approved under Program 4 at the end of June, the current in-country troop strength approximated the authorized ceiling; however, some 30,000 personnel were yet to be deployed. Stringent measures had to be imposed to remain within the established ceiling and yet meet command objectives.

Component commanders were held responsible for not exceeding established strength ceilings, and appropriate accounting procedures were to be established to insure compliance.[10/]

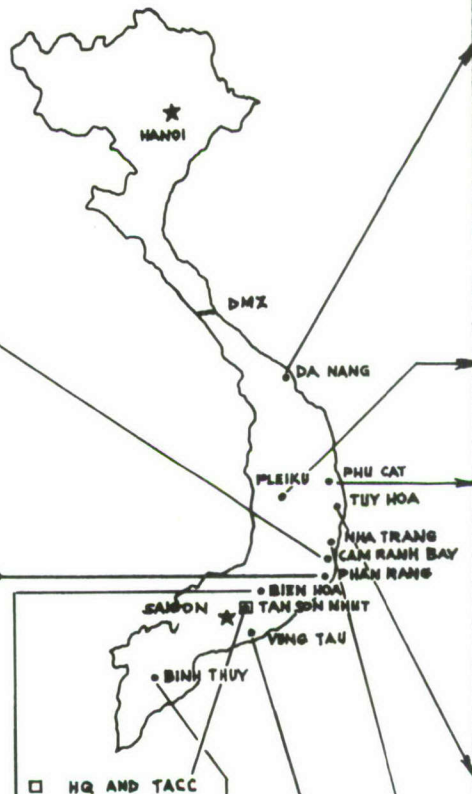
New Tactical Fighter Wing

Establishment of an F-100 Wing at Phu Cat in 1967, following activation of Tuy Hoa in November 1966, improved fighter coverage in the four corps tactical zones, especially in view of increased activity in I Corps and along the DMZ. The 37th Tactical Fighter Wing (TFW) was formed on 1 March 1967, one year after selection of Phu Cat as an air base site. The 37th TFW was composed of Deputy Commander for Operations, 416th Tactical Fighter Squadron, (TFS), Detachment (Det) 1, 612th TFS, Deputy Commander for Materiel, Supply Division, and 37th Combat Support Group.

The 416th TFS, 3d TFW, at Bien Hoa was transferred to the 37th TFW at Phu Cat on 29 May. On 30 May, it flew 12 fragged sorties and two alert sorties to become the first operational tactical fighter squadron at Phu Cat. New areas of operations for the 416th TFS, mainly I Corps, Laos, and NVN were opened in June. All pilots were thoroughly briefed on operations in these areas, and the first mission was flown north of the DMZ on 17 June 1967. After several delays, Det 1, 612th TFS, was transferred on 8 June from Phan Rang to Phu Cat, flying its first combat sortie on 9 June. The 612th TFS was back to near normal operations by the end of June, and was flying 18 sorties, plus alert scramble every day. (See Fig. 2.)[11/]

AIRCRAFT UNITS IN VIETNAM

INSTALLATION ORGANIZATION	UE
CAM RANH BAY	
483 TCW	
457 TCS	16 C-7
458 TCS	16 C-7
12 TFW	
391 TFS	18 F-4C
557 TFS	18 F-4C
558 TFS	18 F-4C
PHAN RANG	
35 TFW	
306 TFS	18 F-100
352 TFS	18 F-100
614 TFS	18 F-100
615 TFS	18 F-100
309 AC TCS	12 C-123
310 AC TCS	16 C-123
ROT TBS	24 B-57
BIEN HOA	
3 TFW	
Det 1	18 A-37
90 TFS	18 F-100
510 TFS	18 F-100
531 TFS	18 F-100
19 TASS	55 O-1
12 ACS(DEFOL)	18 UC-123
604 ACFS	25 A-37
ROT FIS	6 F-102
TAN SON NHUT	
Hq 7th AF	
834 AD	
460 TRW	4 RB-57
360 TEWS	17 EC-47
12 TRS	18 RF-4C
16 TRS	18 RF-4C
45-1 TRS	16 RF-101
309 AC TCS	12 C-123
19 AC TCS	16 C-123



INSTALLATION ORGANIZATION	UE
DA NANG	
366 TFW	
389 TFS	18 F-4C
390 TFS	18 F-4C
480 TFS	18 F-4C
20 TASS	55 O-1
311 AC TCS	16 C-123
ROT FIS	6 F-102
PLEIKU	
633 CSG	
1 ACS (COMP)	25 A-1
9 ACS (PO)	6 C-47
	18 O-2
362 TEWS	15 EC-47
PHU CAT	
37 TFW	
416 TFS	18 F-100
612-1 TFS	18 F-100
537 TCS	16 C-7
459 TCS	16 C-7
TUY HOA	
31 TFW	
15 TFS	18 F-4E
306 TFS	18 F-100
308 TFS	18 F-100
309 TFS	18 F-100
NHA TRANG	
14 ACW	
4 ACS (FS)	22 AC-47
5 ACS (PO)	6 C-47
	20 U-10
310 AC TCS	16 C-123
361 TEWS	15 EC-47
21 TASS	55 O-1
20 HS	14 CH-3
	15 UH-1
VUNG TAU	
535 TCS	16 C-7
536 TCS	16 C-7

BINH THUY	
504 TASG	
25 TASS	55 O-1

FIGURE 2

A-37 Aircraft

Introduction of the A-37 aircraft into the theater would provide 7AF with a significant increase in the number of sorties available in III Corps and northern IV Corps. One squadron of 25 Cessna A-37 aircraft was to deploy as a unit to Bien Hoa on 28 July 1967. The 604th ACS would conduct a 90-day test program and after completion of the test on 1 November, it would continue as a permanent part of the 3d Tactical Fighter Wing at Bien Hoa. 12/

F-4D Aircraft

Early in the year, PACAF proposed replacing F-4C aircraft in Southeast Asia (SEA) with F-4Ds currently programmed for WESTPAC units. Concurring with the proposal, 7AF recommended specific items of equipment be incorporated in F-4Ds prior to deployment. Tactical Air Command (TAC) had certain reservations about the program as proposed, and suggested that F-4D operational/logistical support problems be thoroughly reviewed and resolved before changing it. 13/

A modernization program, approved by the Chief of Staff, Air Force (CSAF) in May, necessitated relocation of some tactical fighter squadrons within Thailand, to permit consolidation of similar type aircraft for efficient use of support equipment and increased operational effectiveness. Relocation of EC-121s from Ubon to Udorn in July 1967, and a further move to Korat in October 1967, would be necessary to accommodate consolidation of fighter squadrons at Ubon. The first three F-4D squadrons in SEA would be replacement squadrons from CONUS, and the remaining five F-4D squadrons in SEA would

be in-place conversions of F-4C units. Due to similarity of aircraft, CINCPACAF said any degradation of operational capability during conversion was expected to be minor and temporary. The F-4Ds would significantly improve bombing accuracy and the all-weather/night capability. The program would not change unit force levels in any country, and Program 4 minor manpower adjustments would be made.[14/]

The programmed Replacement and Conversion Program would be as follows:[15/]

SEA Replacement Squadrons from CONUS

DATE	SQUADRON	CURRENT AIRCRAFT	NEW AIRCRAFT	REMARKS
May 67	555 Ubon	F-4C	F-4D	F-4Cs to attrition
Jul 67	435 Ubon	F-104	F-4D	Unit moves from Udorn, F-104 a/c to CONUS
Oct 67	13 Udorn	F-105	F-4D	Unit moves to Korat, F-105s to attrition
		SEA In-Place Conversion		
Oct 67	433 Ubon	F-4C	F-4D	F-4Cs to Misawa
Nov 67	497 Ubon	F-4C	F-4D	F-4Cs to Yokota
Jan 68	389 Da Nang	F-4C	F-4D	F-4Cs to Yokota
Feb 68	390 Da Nang	F-4C	F-4D	F-4Cs to Yokota
Mar 68	480 Da Nang	F-4C	F-4D	F-4Cs to Misawa

O-2A Aircraft

The PACAF concept for employment of O-2A aircraft was to replace O-1s with O-2As on a one for one basis. Starting in June 1967 and ending in December 1967, 143 O-2A aircraft would be deployed to SEA. When in place, they would be primary mission aircraft for use in areas where greater capability

was required. SEA experience had shown that when tactical mission aircraft were available, their capability was fully exploited. It was anticipated that tactical employment of O-2As in high-threat and mountainous-terrain areas would be no exception. 16/

F-111 Aircraft

To provide an improved night, all-weather level radar attack capability, six TAC F-111s would be ready for deployment to SEA by 15 January 1968. Harvest Reaper, an element of the 428th TFS/474th TFW, would form, equip, train, and deploy from Nellis AFB with 29 officers, 256 airmen, and some technical personnel. The flying-hour-utilization rate was to be 45 hours per month per aircraft; the sortie rate, .66 sorties per day per aircraft; and the drop rate .6 per sortie. TAC considered Phan Rang (originally proposed as a beddown base), unsuitable for these aircraft, because of its vulnerability to mortar and other enemy attacks. Thirteenth Air Force recommended instead Takhli, Korat, Udorn, and Ubon, in that order of preference, and concurred with CINCPACAF that Takhli was the most desirable deployment base for F-111s, because of the programmed move of eight KC-135s to U-Tapao in December 1967. 17/

RB-58 Aircraft

In another effort to provide improved all-weather bombing capability for SEA, the JCS proposed early in the year, use of a force of four RB-58s, 104 support personnel, and 74 tons of support equipment there. CINCPACAF and CINCPAC supported this RB-58 proposal, with the former recommending beddown of the aircraft at U-Tapao, on an austere basis with tents, crew vans, and

temporary construction, until permanent facilities could be programmed. CINCPACAF also believed the RB-58s should be employed as strike and marker aircraft and in the Pathfinder role at medium and high altitudes. Their mission should be integrated with the ROLLING THUNDER program, complementary to it, and under operational control of 7AF. 18/

As a result of extensive testing, it was concluded that improvement in the all-weather bombing capability provided by RB-58s, as opposed to F-105F and F-4D aircraft, did not warrant their deployment to SEA in the near future. Opposing recommendations had been made by each participant at a Joint Air Staff Conference attended by TAC, SAC, and PACAF in May 1967. Efforts to develop the RB-58 conventional munitions delivery capability, however, would be continued. 19/

CHAPTER III

AIR SUPPORT OPERATIONS

Introduction

During the first six months of 1967, USAF intensified its air support operations in South Vietnam. These included close air support and interdiction sorties by strike pilots, forward air controller sorties, B-52 strikes, AC-47 sorties, and other fixed-wing and helicopter support in all forms. 1/

Close Air Support

During January, Air Force attack-type aircraft flew a total of 8,584 sorties of various types with 549 (six percent) additional sorties cancelled due to weather. Tactical fighters supported ten specific ground operations with approximately 2,500 strike sorties. Operations CEDAR FALLS and THAYER II received the most air support, with 1,113 and 620 sorties, respectively. 2/

A total of 8,782 sorties of various types were flown during February, with 91 (1.1 percent) additional sorties canceled due to weather. Tactical fighter aircraft supported 11 specific ground operations, with Operations JUNCTION CITY and SAM HOUSTON receiving the largest number of sorties--879 and 754, respectively. There were no attack sorties flown during the Tet standdown (080700H-120700H February 1967.) 3/

With ground action reaching a new peak in intensity during March, air support likewise increased. More than 11,000 sorties were flown during the month, of which 8,804 were close air support (CAS), interdiction, or escort. Airstrikes continued to demonstrate effectiveness and flexibility by quick

reaction against fleeting targets throughout the country. For example, tactical air alone accounted for 160 VC KIA, when they were caught crossing an open field southwest of Quang Ngai. 4/

USAF aircraft completed 9,295 tactical fighter strikes in-country during April, which included 6,502 strikes in close support of ground forces. In May, as in April, contacts with the enemy were most frequent, intense, and prolonged in I Corps and south of the DMZ. The level of tactical strikes also remained at approximately the same level during May, with the Air Force flying 9,059 strikes of which 7,050 were CAS. 5/

The majority of the 9,272 strike sorties flown during June were in close support of ground forces. More than 3,000 strikes were in support of 13 major operations with FRANCIS MARION and PERSHING receiving more than 800 each. 6/

Major CAS Operations

A more detailed account of close air support provided ground troops in major operations follows:

Operation SAM HOUSTON (18 Jan-5 Apr)

Operation SAM HOUSTON, originally named PAUL REVERE V, continued the series of operations in Pleiku Province, which began in May 1966. It demonstrated some of the difficulties encountered in providing air support to ground troops in the unique environment of South Vietnam. During this operation, the enemy made significant changes in tactics formerly employed by him. The majority of contacts were made by rifle companies, while

conducting search-and-destroy operations with the enemy avoiding ground attacks against units in prepared positions. This change in tactics had important repercussions on the application of airpower. Friendly units were usually attacked or ambushed, while moving through heavy jungle. Substantial friendly casualties were often inflicted before air and artillery could react. Close proximity of friendly forces to the enemy, the dense overhead cover, and dispersed deployment of a moving U.S. force made positive identification of friendly positions extremely difficult from the air. Consequently, close air support was considerably delayed at a time when it was most critically needed. 7/

Although B-52s supported SAM HOUSTON with 31 strikes expending 3,567 tons of ordnance on suspected enemy positions, no significant BDA was evident. During this operation, nine of the 11 battalion-sized contacts were less than 3,000 meters from friendly Fire Support Bases. It seemed reasonable to assume the enemy was aware of the 3,000-meter minimum safety limit from friendly troops for placement of B-52 strikes. The enemy's thorough knowledge of the area and his effective reconnaissance enabled him to move swiftly against Free World Forces, greatly reducing the amount of time during which his large troop concentrations were exposed to ARC LIGHT strikes. Psychological impact of ARC LIGHT strikes on the enemy, however, was one of the most important side effects. Enemy prisoners of war indicated that B-52 bombers were a source of constant terror to them. 8/

Air support to Operation SAM HOUSTON totaled 2,500 sorties: 1,494 FAC preplanned, 473 FAC immediate, 409 preplanned COMBAT SKYSPOT, 57

immediate COMBAT SKYSPOT, and 67 AC-47 "Spooky". USAF tactical sorties delivered 8,152 bombs, 777 canisters of CBU, 3,396 cans of napalm, 477 rockets, 262,842 rounds of 20-mm cannon, and 310,000 rounds of 7.62-mm (AC-47s)--a total of 4,834 tons or ordnance. The BDA from SAM HOUSTON tactical air support included 176 huts, 322 bunkers, 20 AA/AW positions, 43 secondary explosions, and 153 bodies believed KBA.

This was not the whole story, however, as indicated in this After Action Report: 9/

> *"The damage assessment does not reflect the true value of the CAS used! This is especially true in the figures for enemy killed. Assessment of strike damage is often difficult to obtain because ground units sometimes do not enter the strike area until hours, or even days, after the strike, if at all. Strikes on the majority of targets must be assumed by aerial observers whose observation is limited because the heavy jungle frequently prevents them from seeing the ground."*

Operation THAYER II (25 Oct 66-12 Feb 67)

Operation THAYER II was part of the continuing U.S. effort to pacify northern Binh Dinh Province, one of the most populated and heavily contested areas of the country. During the approximately three and one-half months' duration of this multi-brigade search-and-destroy operation, the Air Force flew a total of 2,248 sorties, and expended 2,264.3 tons of bombs, rockets, napalm, CBU, and 20-mm cannon fire. The B-52s added another 156 ARC LIGHT sorties and dropped a total of 3,089 tons of ordnance against enemy targets. In summarizing effectiveness and responsiveness of airpower to the needs of the 3d Brigade, 25th Infantry Division, its ALO stated: 10/

"Communications and coordination were effective and provided excellent timing during the operation. All immediate air requests were dispatched with the utmost speed, the minimum being 15 minutes and the maximum 24 minutes. In most cases, ground troops were able to sweep the area of the strikes, although their reports could have been more comprehensive in some cases."

Operation JUNCTION CITY (22 Feb-16 May)

Operation JUNCTION CITY, a multidivision operation initiated in Tay Ninh Province, was directed against the enemy in War Zone "C", an area suspected of containing Central Office, South Vietnam (COSVN) Headquarters elements. A B-52 strike was directed into the area just before midnight on 21 February and three more B-52 strikes pounded the area before dawn the next day. At daybreak, tactical fighter pilots began blasting out landing zones for paratroopers and helicopters. The softening up strikes were followed through the day with air attacks on enemy base camps, troop locations, storage areas, and fortifications. Results of the first day's operation, when 216 strike sorties were flown in direct support of ground troops, were an estimated 17 KBA, 15 structures destroyed, 10 damaged, 9 bunkers destroyed, 1 secondary explosion, and 3 secondary fires. 11/

At the end of JUNCTION CITY, Phase I, on 15 March 1967, the statistics were 1,541 preplanned and 433 immediate strike sorties resulting in 71 confirmed KBA, and 287 estimated KBA; 145 structures destroyed, 25 damaged, 542 bunkers destroyed, 454 damaged, 15 sampans destroyed and 3 damaged, 3 bridges destroyed, 1 truck damaged; 6 highway cuts, and 26 secondary explosions. 12/

When Phase II of the operation terminated on 15 April, an additional 2,002 tactical strike sorties had been expended in direct support of JUNCTION CITY, bringing the cumulative figure to 3,974 sorties. The results for this effort were 118 structures destroyed, 37 damaged, 634 bunkers destroyed, 428 damaged, 3 sampans destroyed, 2 bridges damaged, 1 truck damaged, 63 secondary explosions, and 2,002 meters of trenches destroyed, and 1,360 meters damaged. This tremendous strike support effort was responsible for a large number of KBA during Phase II. ARC LIGHT missions also destroyed or damaged substantial numbers of fortifications and camp sites. Phase II of the operation was conducted on a greatly reduced scale, with JUNCTION CITY terminating on 14 May 67--in terms of confirmed enemy losses, the most successful operation to date. A total of 2,728 Viet Cong and North Vietnamese had been killed by body count, 99 detained, and 137 accepted as returnees. Enemy equipment losses were heavy and included nearly 500 small arms, a hundred crew-served weapons, 100,000 rounds of small arms ammunition, equipment, food supplies, and other material. Friendly losses were 282 KIA, 1,576 WIA, and approximately 180 tanks, carriers, trucks, support vehicles, and artillery pieces destroyed or damaged. 13/

Total air sorties flown in support of JUNCTION CITY reached 5,002 tactical strike sorties delivering 7,429.8 tons of ordnance; 126 B-52 sorties, expending 4,723 tons of ordnance; 89 recce targets flown; and the airlifting of 17,524 passengers and 11,307.7 tons of cargo. 14/

Operation ENTERPRISE

The important role played by FACs was demonstrated during Operation

ENTERPRISE (the Battle of Doi Ma Creek). The first two months of Operation ENTERPRISE were characterized by preplanned search-and-destroy missions of short duration by U.S. and ARVN units. These operations, involving large airlifts into known VC strongholds, were not very effective, since the enemy was always on the move.

The first battle of major significance occurred on 9-10 April 1967, approximately five kilometers west of Rach Kien along Doi Ma Creek. It resulted from hard intelligence provided by a FAC on 8 April who observed small groups of VC in the target area. He directed the first airstrike into this area and, in addition to receiving ground fire, the FAC saw a large number of enemy trying to avoid the brunt of the attack. A second airstrike was directed against another VC target in the area. It soon became apparent that a sizable enemy force was located along the Doi Ma Creek.

Final results of the three-day operation were 247 VC KIA (BC) and one POW. Total friendly losses were 5 KIA, 1 POW and 31 WIA. Thirty-seven tactical air sorties were flown in support of the operation, dropping more than 57,000 pounds of explosives, 12,000 pounds of napalm, firing 24 pods of air-to-ground rockets, plus an undetermined amount of 20-mm and .50 calibre ammunition. In addition, three AC-47 flareship sorties were flown. This combined air action resulted in 22 structures destroyed, 50 structures damaged, 6 sampans damaged, 3 secondary explosions, and 75 dead by air (BC).

The air role in support of Operation ENTERPRISE again illustrated that:

* Aerial surveillance was invaluable in locating and identifying VC forces.

* Airpower must be used in relentless pursuit of a fleeing enemy once he is located.

* Airpower should be available, one strike following another, to prevent the enemy from taking cover or escaping.

* AC-47 flareships were invaluable in denying VC forces the element of darkness for escape once he was located and engaged. 15/

Operation HICKORY

Operation HICKORY, the first overt US/ARVN attack into the DMZ, was launched on 18 May 1967. It called for a multipronged assault into the DMZ, with forces of the 3d Marine Division and Vietnamese Army (ARVN) units striking north into the heart of the lowland area, and a Marine landing force sweeping in from the eastern coast. Close support for ARVN was provided by 7AF, while the Marine tactical air arm provided support for its units. 16/

Enemy Reaction

One report of enemy reaction to U.S. air was furnished by a 38-year-old Captain and Battalion Commander of Regiment Nr. 2, Sao Vang Division, who was captured in Binh Dinh Province. He evaluated GVN/US aerial firepower as follows:

1. Despite their firing accuracy, low-altitude flying helicopters made them the easiest target for VC units to counteract.

2. The VC feared the Skyraider, which had accurate and powerful fire and could maintain an attack for long periods. Without help from reconnaissance planes, it could find and attack targets close to VC troops during an engagement.

3. The F-100 and F-105 were feared because of their tremendous noise, but their attack periods were short--never exceeding 30 minutes--and their high speed precluded accurate bombing.

4. Destructive power of B-52s was greatly feared, although they flew at very high altitudes, their bombing was accurate. Some of the enemy, who were not hit by bomb fragments, were known to have died from concussion. 17/

ARC LIGHT PROGRAM

Since its inception in 1965, the ARC LIGHT program had significantly expanded in terms of increasing force expenditures, innovations in the type of missions, enlargement of areas of concentration, and the northward movement of target nominations and strike sorties. In the past, B-52 strikes had concentrated on destroying enemy base areas and enemy forces associated with them. COMUSMACV stated this role would continue during 1967, but emphasis would also be placed on integrating preplanned B-52 strikes with ground tactical operations.

The ARC LIGHT effort contributed to three interdependent undertakings, which together constituted an integrated concept for the conduct of war. These B-52 operations helped extend the secure areas of South Vietnam by seeking out and destroying the Communist forces and infrastructure in South Vietnam. They assisted in taking the war to North Vietnam by moving the areas of operations northward, and by hitting targets which were partially in North Vietnam. ARC LIGHT forces also assisted in reducing external assistance to South Vietnam by harassing, disrupting, and impeding the movement of men and material coming from North Vietnam via the DMZ and Laos. 18/

During the first six months of 1967, a total of 4,705 B-52 operational sorties were flown in Southeast Asia, providing a monthly sortie rate of 767 compared to 588 in 1966. Seventy-seven percent of the B-52 strike sorties were carried out in South Vietnam, 21 percent took place over Laos, and the remaining 2 percent were concentrated in the DMZ. Approximately 25 percent of the sorties flown in South Vietnam and the DMZ were in support of major U.S. ground operations. 19/

In January, CINCPAC stated additional ARC LIGHT forces would be deployed to Andersen AFB, Guam. The 725 sorties authorized for January would increase to 800 in February, and remain at that level thereafter. It was desirable to maintain a steady average of 26 sorties per day, with a maximum of 36 sorties in any 24-hour period. This pattern should be scheduled for two launch periods per day, approximately 12 hours apart, and consisting of 12 to 15 aircraft each. This would provide an even flow of recovery and regeneration action. Maximum turnaround capability was 36 aircraft, 24 hours after landing from the last strike missions. 20/

JCS considered a possible increase in B-52 sortie rates, should they be required to support COMUSMACV's summer campaign. They recognized that ARC LIGHT sortie rates in excess of the 800 per month could not be maintained for more than two or three months without major adjustments to the programmed munitions production. The 7AF believed an increase to 1,000 sorties per month by 30 June 1967 was reasonable and could be employed effectively by using forces currently on hand. 21/

UNCLASSIFIED

B-52s DROPPING BOMBS
FIGURE 3

UNCLASSIFIED

Interdiction

At the beginning of the year, COMUSMACV expressed concern over the interdiction program in Laos, which had not been as productive as expected. The 7AF proposed that ARC LIGHT forces be employed in an anti-infiltration program in STEEL TIGER/TIGER HOUND areas of Laos. A test program of concentrated air attacks against six special route-interdiction points known as Operation HUB began on 4 March 1967. The ARC LIGHT force was supplemented by Combat Support control, which directed strikes against major choke points. In addition, B-52 strikes were integrated with tactical aircraft strikes and visual and photo reconnaissance. The HUB operation lasted approximately two weeks and was then replaced by a modification of the same concept. 22/

The 7AF reported to COMUSMACV that the ARC LIGHT interdiction program, coordinated with tactical airstrikes and maximum presence, appeared to have restricted utilization of LOCs by the enemy. This evaluation, based upon available Side-Looking Airborne Radar (SLAR) and photo recce of the STEEL TIGER area, also revealed the program had forced the enemy to make considerable diversions to alternate routes. The 7AF concluded there was considerable potential in continued application of the ARC LIGHT program to the STEEL TIGER/TIGER HOUND interdiction and harassment campaign. In his evaluation of the program, COMUSMACV pointed out to JCS in April, the measure of effectiveness was reflected by the enemy's efforts to improve his LOC defense. To counter this effectiveness, the enemy had been forced to increase his antiaircraft fire and place searchlights in the area of potential attack

by B-52s. Weekly truck sightings in the TIGER HOUND area had also dropped during the month of April to one-third of what the sightings were in March. 23/

In his review of the infiltration problem at midyear, CINCPAC stated it would be necessary to employ new innovations, such as increased use of coordinated tactical air joined to the ARC LIGHT forces. It would be necessary to have a continuous joint interdiction operation starting at the inception of imports into NVN and ending at the battlefield in RVN. The mainstay of the anti-infiltration effort had been and should continue to be in the ROLLING THUNDER area, with complementary efforts continued in other areas such as STEEL TIGER and TALLY HO. 24/

TINY TIM

TINY TIM was the unclassified nickname used to identify the plan which provided anti-SAM support to SAC forces operating in a suspect SA-2 environment. The enemy had deployed SA-2 units to the southern portion of NVN, and it was feared B-52s carrying out strikes in the DMZ, the northern portions of I Corps, Route Package I, and in Laos along the border area adjacent to Route Package I, might be vulnerable to attack by SAMs. CINCPACAF was to be the primary and CINCPACFLT the secondary source of the anti-SA-2 support for ARC LIGHT missions. The 7AF Commander would act as CINCPACAF coordinating authority for TINY TIM matters with COMUSMACV and CINCPACFLT designated representatives. The objective of support forces would be to determine the presence of SA-2 units, nullify their effectiveness by ECM, and when feasible, locate and destroy the SA-2 sites. 25/

~~SECRET~~

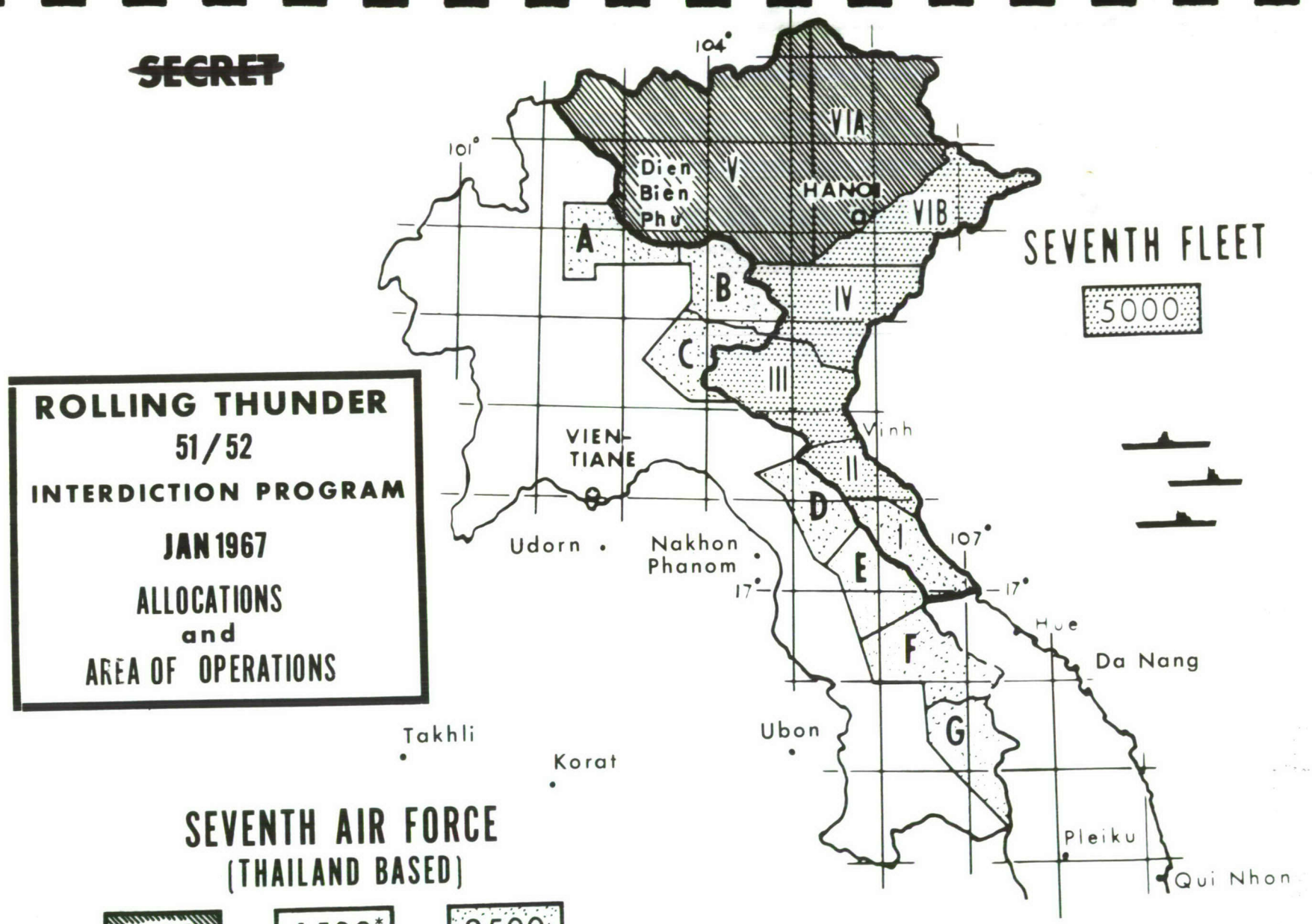


FIGURE 4

~~CONFIDENTIAL~~

COMUSMACV informed the 7AF Commander on 26 February that CINCPAC was withholding execution of ARC LIGHT strikes in and north of the DMZ, in view of identification of five SA-2 missile transports in the southern portion of North Vietnam. This withhold order would be in effect until the threat could be located and negated. High priority was therefore placed on search, reconnaissance, and Electronic Intelligence (ELINT) efforts in this area. CINCPAC informed COMUSMACV on 8 April, there was no conclusive evidence to either support or deny existence of SA-2 missiles in the DMZ vicinity. Although lucrative targets existed in the area, because of a possible missile threat, the enemy had been provided a sanctuary where he could operate without fear of B-52 strikes. CINCPAC, accordingly, requested COMUSMACV to select targets which would permit a gradual northward movement, allowing evaluation of a possible SAM threat. On 13 April, COMUSMACV informed the JCS of his belief that B-52 strikes, supported by TINY TIM, could be safely executed in the DMZ. He also provided targets in priority order for recommended strikes to CINCPAC, who then proposed to the JCS that ARC LIGHT strikes be scheduled in the DMZ against high priority targets. Each of these missions would be weighed carefully and flown with the maximum feasible TINY TIM support. On 7 June, the JCS concurred with CINCPAC's proposal, and COMUSMACV was informed that ARC LIGHT operations would be resumed in the DMZ under certain conditions.[26/]

In an evaluation of the effectiveness of the TINY TIM Support Plan, the Commander, 7AF, advised CINCPACAF in June, the five elements comprising the TINY TIM Support Plan (Iron Hand, MIG-CAP, fighters, ECM, diversionary fighters and photo recce), had not been employed in a manner which gave

positive proof of the total plan effectiveness. Whereas ELINT detection capabilities of TINY TIM elements were comparatively well established, suppression and strike capabilities needed further proof. He recommended continued application of TINY TIM support elements, but stated they should be principally directed toward protection of the bomber force when it was in a potential threat environment. Less emphasis was to be given to threat area preparation, since normal ELINT activity with divertable strike measures could sanitize any definite threat detected. It was assumed the bomber force would not be programmed into a high SAM threat area and, for this reason, provisions were not made for "maximum" TINY TIM support. 27/

POKER DICE Program

Although SAC B-52s were still operating out of Andersen AFB, Guam at the beginning of 1967, plans to move the strategic bombers closer to the combat area had been underway for some time. South Vietnam was considered as a base but then rejected, due to factors of security, crowded air bases, a late beneficial occupancy date, and an adverse impact on the local economy. On 23 January, the American Ambassador requested Thai approval for use of U-Tapao for ARC LIGHT operations, although the U.S. government had not yet made a firm decision about its use. After much discussion, the Thai government on 2 March granted permission for the POKER DICE (nickname for deployment of B-52s to U-Tapao) program, and construction of facilities was begun. Provided with new tactical options, the B-52s started flying combat sorties out of U-Tapao in April. By midyear, ten B-52s stationed at U-Tapao had fulfilled 32.7 percent of the sorties flown in support of ARC LIGHT activities in South Vietnam. 28/

Overflights

The American Ambassador in Vientiane advised the Secretary of State on 10 June, he had no objection in principle to use of ARC LIGHT forces from U-Tapao for strikes against targets in Laos, provided they flew south around Cambodia, and were accompanied by a cover strike in Vietnam. Since the Thai government was kept fully informed of U.S. use of their bases, this raised the question of whether the Laotian government should also be notified of these strikes. Because of security and political implications involved in working out a satisfactory disclosure policy, it was decided that B-52 strikes in Laos should temporarily be launched from Guam. As this meant a reduction in flexibility, SAC informed JCS if this restriction continued, it would introduce serious scheduling problems. 29/

The multitude of written, stated, and implied restrictions on Laotian overflights was a matter of serious concern to the 3d Air Division at Andersen AFB. In May, they requested complete ground rules relative to overflight/bombing of Laos for B-52 forces stationed at Andersen and U-Tapao. The urgent necessity of clarifying ground rules was obvious in view of the SAM threat, the prohibition of Laos overflights, the imcomparability of alternate targets, the TOT spread between Laotian strikes and South Vietnam cover strikes, air space availability, safety considerations, etc. CINCSAC provided the following guidance: 30/

1. On 3 May 67, JCS had authorized a minimum feasible penetration into Laos, NVN and Cambodia, and the limits of the DMZ at or above 20,000 feet as was required for pre or post-strike overflights when the target

was in the DMZ, South Vietnam or the southern portion of NVN. This rule applied to B-52 strikes from either Andersen or U-Tapao. Based on experience, it was known the American Embassy in Laos would not approve a daylight overflight in excess of about five miles, but deeper penetration had been approved by the American Embassy for night overflights.

2. Only B-52s striking from Andersen could be used for strikes in Laos. Overflight authority was given by the JCS on 3 May 1967, which stated in part that "AMEMB concurrence for strikes in Laos shall constitute authority for pre/post-strike penetration of the territory involved."

3. U-Tapao-based B-52s would not strike in Laos until authorized by CINCSAC.

4. Andersen-based B-52s could strike in Laos but could not withdraw over Laos direct into Thailand.

5. U-Tapao sorties could strike targets in SVN with the minimum feasible overflight of Laos and recover at Andersen. U-Tapao sorties could not strike targets in Laos.

6. A cover strike in SVN had to be in the same time frame as the Laotian strike to be credible. One hour would be the maximum period until further instructions were given.

CINCPAC believed ARC LIGHT strikes against targets near the SVN-Laos Border often required more than the "minimum feasible penetration" authorized by JCS. Every effort had been made to orient the target box, so as to permit maximum bomb coverage on an area of attack which would reduce penetration of Laos as much as possible. Proximity of the target to the Laotian Border often required relatively deep penetration. CINCPAC, therefore, requested the American Embassy in Vientiane give blanket approval for overflights during hours of darkness within a certain portion of Laos. This

concept would be an additive, rather than a unique requirement for use of the Laotian airspace and would increase flexibility of operations. Use of inflight diversion, quick reaction, or ground diversion capabilities, or strikes in South Vietnam under existing conditions was practically impossible, whenever extensive penetration of Laos was reduced due to the time required for obtaining overflight approval. 31/

Laotian overflights during daylight hours were another long-standing problem, which had been the subject of considerable discussion between military authorities and the American Ambassador in Vientiane. On 28 June, the Ambassador indicated he was willing to permit daylight overflights, subject to certain restrictions, on a trial basis, including at least 24 hours advance notice of the time and path of the pending overflight.

U-Tapao Security

It was a well-known fact that damage or destruction of a B-52 aircraft would be a spectacular propaganda victory for the enemy. COMUSMACTHAI reported that:

> *"...Security measures on U-Tapao, where enemy attempts are most likely and where US security responsibility is most clearly defined, are marginally adequate. Area security needs improvement...."*

The security problem at U-Tapao was of extensive scope and included sensitive areas, such as adjacent water approaches, ammunition storage areas, POL storage farm, POL pipeline, off-base security, as well as the aircraft themselves. The B-52s were not revetted, nor was there a security fence

around the area. The continuing construction program and insufficient number of security forces were especially conducive to acts of sabotage. The small boat patrol force being used to screen sea approaches was considered quite insufficient. Secondary operations in support of B-52s--POL, ammunition storage, pipelines, unloading piers--were considered the most likely targets and completely vulnerable to mortar attacks, if not sabotage attempts. COMUSMACTHAI advised CINCPAC the answer was to initiate a program focussing on the same areas as those already under way in South Vietnam; i.e., an increased number of security forces, establishment of command posts, and if possible, working in coordination with the Thai government. 32/

ARC LIGHT Effectiveness

The Secretary of State made the following comments on ARC LIGHT effectiveness: 33/

> *"...By capitalizing on the bomb load carrying capability, high concentrations of firepower can be delivered with great accuracy in a designated area during a short period of time.*
>
> *"The use of high altitudes for bomb delivery provides an element of surprise as the aircraft is not heard and the first indication of attack is exploding bombs.*
>
> *"The B-52s strike deep within enemy controlled areas, day or night, keeping the enemy on the move and requiring air raid protection at each rest area.*
>
> *"The use of B-52s in South Vietnam has caused the enemy to change tactics and to avoid the massing of troops for appreciable periods of time.*
>
> *"The B-52 has been very effective in softening an area prior to ground troop penetration.*
>
> *"On many occasions, COMUSMACV, on the basis of*

prisoner and defector interrogations, has reported the adverse psychological effect B-52 bombing raids have had on the enemy...."

PACAF observed at midyear that reports of ARC LIGHT effectiveness included much data on craters and physical damage to foliage and terrain, but there was little quantifying information. ARC LIGHT results obtained through visual reconnaissance by Forward Air Controllers were limited due to poor weather over target areas throughout Vietnam, density of the jungle canopy, and in some cases, enemy ground fire. The follow-up of B-52 operations by ground forces was also a continuing problem. At the beginning of the year, the percentage of reports being received on ground follow-up actions was exceedingly small, but steps were taken by COMUSMACV to provide more accurate and timely information. When a strike was made, however, the ground scheme of maneuver did not always include or permit passage of troops through the strike area. Although desirable, it was not always possible to conduct a thorough, deliberate search of a strike area, since this was a time-consuming process that might require a considerable number of troops. It was necessary, however, to continue BDA ground reconnaissance on a selective basis in a near-time frame, and COMUSMACV emphasized to unit commanders that maximum ground follow-up of ARC LIGHT strikes would be accomplished, with available information reported promptly. In general, ground follow-up reports continued to describe terrain, size of craters, and damage to foliage caused by B-52 ordnance, but they contained little data to show significant casualties or damage to vital stores.

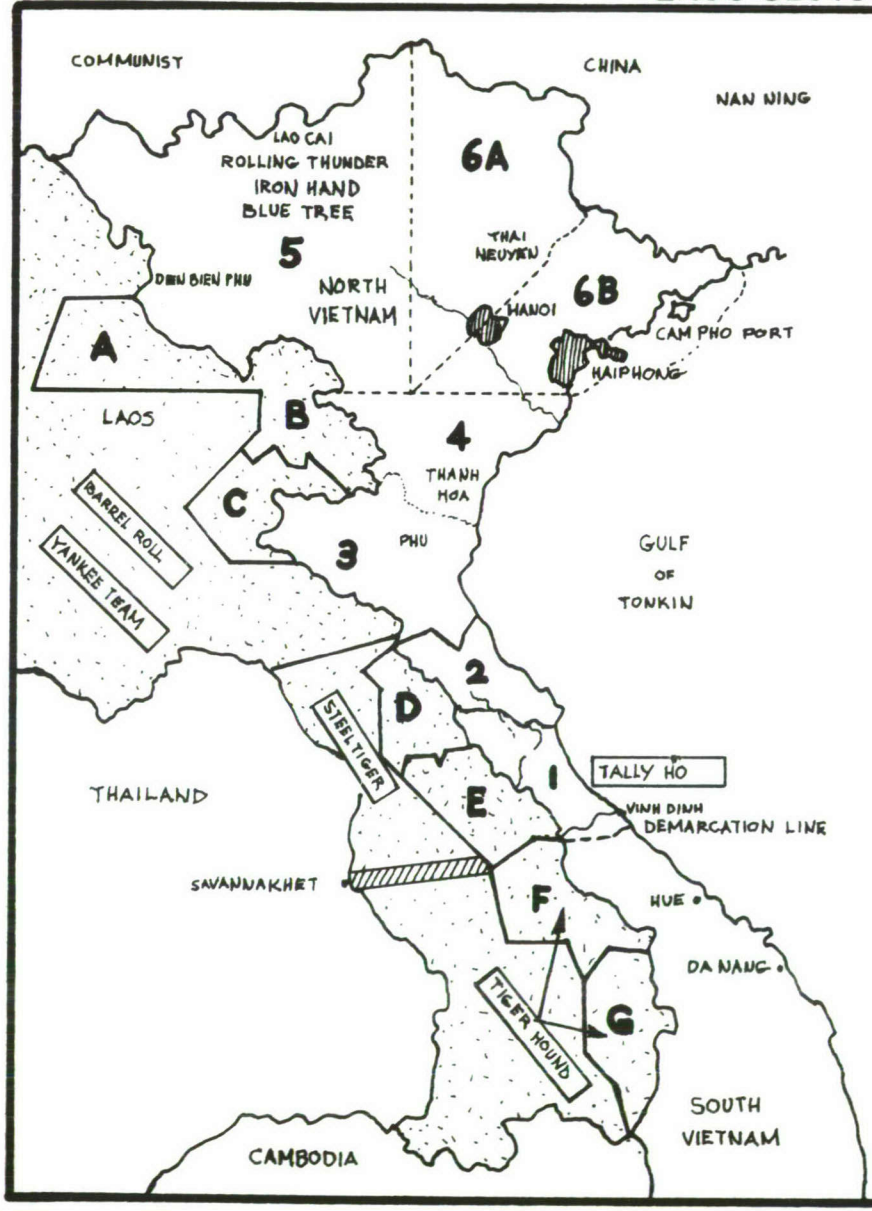
Reconnaissance Operations

At the beginning of the year, there were 83 tactical reconnaissance aircraft in place in South Vietnam and 61 in Thailand. The only significant increase in reconnaissance aircraft during the first six months of 1967 was acquisition of 16 additional EC-47s. During this period, tactical reconnaissance aircraft flew a total of 23,365 sorties in SEA--a 46 percent increase over the 16,073 sorties flown during June - December 1966. Combat losses during the first half of 1967 were 12 aircraft versus 13 during the last half of 1966. This represented an average of one combat loss per 1,957 sorties in the current year as compared with one loss per 1,234 sorties during the same period last year. 34/

Classified Projects

Two classified airborne reconnaissance projects under code names PHYLLIS ANN and DRILL PRESS continued to effectively perform their missions. The PHYLLIS ANN mission was "to conduct daily, day/night, all-weather, ARDF operations against enemy-operated transmitters in the RVN and permissive areas of Laos as a basis for tactical exploitation in support of requirements established by COMUSMACV and Comdr of 7AF." Seventeen RC-47 (redesignated EC-47) aircraft were assigned under Project PHYLLIS ANN and two JC-47 aircraft under Project DRILL PRESS. Since the code name PHYLLIS ANN had been compromised from the beginning, it was replaced in March with COMPASS DART. In addition to its primary mission, COMPASS DART was assigned a secondary visual reconnaissance role, in which crews would call in significant sightings and events. Since COMPASS DART aircraft had been hit by ground fire while flying below

USAF STRIKE AND RECONNAISSANE PROGRAMS
NORTH VIETNAM ROUTE PACKAGE AREAS
LAOS SECTOR AREAS



ARC LIGHT
Strikes by B-52 aircraft against personnel and equipment from North Vietnam and Viet Cong.

BARREL ROLL
Strikes in Laos against personnel and equipment from North Vietnam in support of Pathet - Lao/Viet Minh.

BLUE TREE

Reconnaissance in North Vietnam.

IRON HAND
Strikes against SAM Sites in North Vietnam.

ROLLING THUNDER
Strikes in North Vietnam.

STEEL TIGER
Strikes in southern Laos against personnel and equipment from North Vietnam in support of Viet Cong.

TALLY HO
Strikes in southern North Vietnam (South of 17 30) and northern half of DMZ.

TIGER HOUND
Strikes in STEEL TIGER area in Sectors F and G.

YANKEE TEAM
Reconnaissance in Laos.

FIGURE 5

2,000 feet, the minimum altitude during their missions was changed from 1,500 to 2,000 feet above ground. DRILL PRESS aircraft were reportedly Airborne Emergency Reaction Units (ABERU) on reconnaissance missions. Highly significant information was being gathered for immediate use by battlefield commanders and for high level staff planning purposes. (Mission results were not available because of their sensitive classification.)

Other reconnaissance programs with continuing operations were: 35/

BLUE TREE: A program of photo reconnaissance against selected targets and LOCs in NVN, directed by CINCPAC.

YANKEE TEAM: A CINCPAC-directed air reconnaissance program against selected targets and LOCs in YANKEE TEAM operating areas (Laos).

BLUE SPRINGS: A CINCSAC-conducted drone photographic reconnaissance mission in SEA.

TROJAN HORSE: Operation of SAC U-2 aircraft from Bien Hoa or other bases required to photograph selected targets, supply routes, and areas in support of JCS, DIA, COMUSMACV, CINCPAC, and other commands interested in SEA.

Truce Activity

Based on experience gained from previous truce periods, authorities decided to intensify recon activities during the Tet ceasefire of 8 - 12 February. Particular emphasis was to be placed on logistic activity and associated facilities along navigable waterways, offload points, supply caches and transshipment points. Tactical strike aircraft were authorized for: conducting visual reconnaissance; photography with strike cameras; and airborne control centers to scramble or direct photo recon aircraft to significant visual sightings. Offensive ordnance would not be carried on strike

aircraft fragged for visual recce during this period, but defensive ordnance was authorized for use in self-defense.[36]

USAF aircraft flew 367 out-of-country recon sorties during 7 - 13 February. In support of these operations, 71 ECM/ELINT sorties were flown by EB-66B and EB-66C aircraft. No visual reconnaissance sorties by USAF fighter aircraft were scheduled into Route Package I because of poor weather. Three TROJAN HORSE sorties were flown during this period but the two scheduled BLUE SPRINGS missions were canceled. A total of 2,499 vehicles were sighted in RP I during the period 8 - 12 February, and an additional 300 vehicles on 13 February. The majority of the sightings occurred along two main routes to the south, Routes 1A and 15. A total of 3,112 watercraft also were sighted in RP I.[37]

Reconnaissance operations conducted against Haiphong Port during February were of particular interest. At PACAF's request, 7AF implemented a night reconnaissance mission there as military supplies were being offloaded. Two RF-4C aircraft (primary and spare) from the 11th TRS at Udorn deployed to Da Nang and launched their mission on 28 February. To minimize detection by enemy radar, the mission profile was planned at 500 feet or below for the entire route, with the exception of pop up tactics for the target run. The target objective was 100 percent covered.[38]

The first SAM kill in the area of the DMZ occurred on 10 May 1967, when a Marine A-4 was downed. Photography revealed seven camouflaged 57-mm AAA, one missile transporter, and associated equipment. The 7AF decided to utilize a FAC in the rear cockpit of an RF-4C for strikes against SAMS in the

DMZ, because of the increased survivability of higher performance jets over the O-1 aircraft in a SAM environment. An RF-4C with a FAC in the rear cockpit was launched against SAMS on 13 May. The mission was not only successful in obtaining pre-strike and post-strike photography of a suspected active SAM site but also directed a strike against the area. Despite continuing recon and strike efforts, the enemy's camouflage skills and mobility continued to make the SAM threat a formidable one.[39/]

7AF Reconnaissance Study

During this period, the 7AF prepared a study of its reconnaissance operations, with a view toward identifying problem areas and considering the establishment of a Joint Reconnaissance Center (JRC). There were certain limiting factors to the study, including a narrow data margin (January-March 1967); exclusion of non-AF efforts; and consideration of only those visual reconnaissance operations involving optical imagery.[40/] It showed elements of the 7AF conducted two distinct efforts in SEA--in-country (South Vietnam) and out-country (Laos and North Vietnam). Excluding electronic reconnaissance forces, 7AF had these aircraft under its control:[41/]

IN-COUNTRY (TAN SON NHUT)

460th Tactical Reconnaissance Wing

12th TRS	18 RF-4Cs
16th TRS	18 RF-4Cs
45th TRS (Det 1)	18 RF-101s
460th TRW (Det 1)	4 RB-57s

OUT-COUNTRY (UDORN)

432d Tactical Reconnaissance Wing

20th TRS	16 RF-101s
11th TRS	24 RF-4Cs

In-Country Reconnaissance

The initial request for in-country aerial reconnaissance might be generated at any echelon, with priority assigned by the requestor according to guidelines established in MACV Directive 95-11. The request then normally was processed through the Army Air Request Net to the MACV Tactical Air Support Element (TASE), and J-2 Air was responsible for reviewing the request at each succeeding level. Immediate requests were usually sent to the Tactical Air Control Center (TACC) by telephone and followed up by message. After review at the TACC, the target was fragged to either the 460th TRW or the VNAF 33d TFW which in turn designated the aircraft/sensor combination to accomplish the mission. After accomplishing the recon sortie, the pilot would broadcast an in-flight report of any significant sightings to the Direct Air Support Center (DASC) or 460th TRW, which telephoned the information back to the requestor. Since the 460th TRW could not communicate directly with all DASCs, it relayed information through the TACC to DASC. The original intent of the in-flight report had been to provide immediate communication between the recon aircrew and the requestor. However, the report had to be relayed to the requestor by the DASC, since Army units were generally equipped with FM communications, which were not compatible with UHF aboard recon aircraft. The in-flight report might be received by the Tactical Air Control Party (TACP), if it were monitoring proper frequencies at the time

the report was being transmitted.[42]

The study also delineated certain problem areas associated with the in-country reconnaissance cycle; i.e., the format specified by the requestor; incompatible communication between aircraft and ground units; and dispersion of the photo interpretation function. With regard to in-country photo coverage, most requestors identified the exact format they desired. This was frequently a 9-inch by 18-inch photo, covering a large area, which was useful as a photo map. While it reduced handling, accounting, and layout problems for the requestor, it complicated the task of the unit, since only RF-101s flying at about 15,000 feet could satisfy this requirement. At that altitude, weather was frequently a limiting factor. Requests stating a variety of options for satisfying Essential Elements of Information (EEI) were accomplished with a minimal force expenditure. To provide photo mosaic coverage on a routine basis, TACC personnel were considering establishing a requirement for a small number of RC-130 aircraft, which could be used exclusively for photo mapping missions.[43]

As previously mentioned, unnecessary delay occurred in coordinating the reconnaissance strike with Army artillery and relaying the in-flight report to the requestor, because of incompatible communications between the aircraft and ground units. The Air Liaison Officers (ALOs) were equipped with UHF and could communicate between airborne and ground elements during normal duty hours, but they were not manned for a 24-hour operation. Passing information by telephone from the TACC or TASC to the pertinent Army unit was time consuming and diluted accomplishment of the primary function assigned to these

centers. The ALOs were reluctant to turn over their jeep-mounted UHF sets to ground elements during non-duty periods as this relinquished the coordination task for which an ALO was established. It was being done, however, in some areas as an interim measure. The time involved in delivering a finished product to the requestor could be appreciably reduced by consolidating the intelligence effort at the 13th TRS, and accomplishing all necessary photo interpretation at that point. Although there were presently Military Intelligence Battalion Aerial Reconnaissance Surveys (MIBARS) personnel assigned to the 13th TRS, reconnaissance materials were forwarded to the Corps (MIBARS) for additional photo interpretation and subsequent dissemination to the requestor. 44/

Out-Country Reconnaissance

Out-country operations were conducted quite differently from those flown in-country. Requests for out-country recon came principally from CINCPAC, PACAF, MACV, and 7AF. These requirements were forwarded to 7AF DI, where they were evaluated and consolidated into an automated master recon target listing, which was updated daily and completely reprinted every four days. This listing was provided to DOCE for fragging and to the 13th TRS, so that photo interpreters would have coded EEI for each target. 45/

The existing priority system was one of the areas requiring command attention. Since an overwhelming preponderance of requests showed Priority II (Immediate), the present system did not provide an adequate spread of emphasis between requests. Also lacking was a central authority to review reconnaissance requirements, and assess their validity against specific

criteria. This function was accomplished by DI for requests generated within 7AF, but DI had little alternative but to accept at face value, requests coming from PACAF, MACV, JCS, etc. Without a clear definition of criteria for requirements which requestors might follow, there was no guarantee that Priority II needs of one requestor contributed as much to the overall intelligence collection effort as the Priority II needs of another. While out-country and in-country priority systems were not related in any way, at those levels where in-country requirements (generally Priority III-Routine), met with out-country requirements (for example, 460th and 13th TRS), a Priority II requirement would be afforded more expeditious action than would a Priority III. 46/

Joint Reconnaissance Center

In addition to examining the overall reconnaissance picture to isolate deficient areas, the 7AF Directorate of Plans' study examined the question of a Joint Reconnaissance Center (JRC). The study indicated JRCs had been established at JCS and CINCPAC levels, and there had been recurring proposals to establish a similar center in SEA under overall MACV control. The basic reason for establishing any JRC would be to integrate management and control of reconnaissance operations under one centralized authority in a joint staff, which would provide unified direction. There were a variety of reconnaissance activities in SEA provided by the Army, Navy, and Air Force. The bulk of 7AF reconnaissance support was in response to MACV requirements. Although 7AF exercised operational control of its reconnaissance forces, it had little influence over what or how the mission was flown, except for those

requests generated internally. The 7AF determined tactical limitations, but otherwise its control was limited chiefly to establishing the timing when a particular mission was flown; designating a particular aircraft/sensor crew combination to fly the mission; and processing and distributing the intelligence product. 47/

The study showed the major advantage, which the Air Force would gain from establishment of a JRC, would be in the integration of requests and priorities to assure effective and equitable force utilization. The major disadvantage would be the possible effective loss of control of 7AF recon forces, and the risk that AF recon needs would receive consideration secondary to those of other services. The 7AF study advanced certain concepts of operations for the JRC, in the event authority was received to establish such a center. Current 7AF recon operations could be improved largely through organizational, procedural, and coordination techniques. Furthermore, the study stated that a JRC could be established under MACV without 7AF relinquishing control of recon units. The study made the following general recommendations: 48/

* Combine 7AF in-country and out-country recon operations into a single recon center, which could be the nucleus of a future JRC.

* If 7AF were directed to establish a JRC, it should be constructed under it, rather than MACV, since recon responsibilities there did not extend into the northern Route Packages.

* If a JRC were to be established under MACV, it should be constructed under a DEPCOMUSMACV for Air Operations at Directorate level, commanded by an Air Force Brigadier General, and located at Tan Son Nhut.

The recommendation to have a team of 7AF reconnaissance officers established to define corrective actions for deficiencies identified in the report was implemented. Results of the team's findings were to be presented in the future. 49/

SEARCH AND RESCUE

Units of the 3d Aerospace Rescue and Recovery Group (ARRG) were responsible for search and rescue activities in an area 1.1 million square miles, from South Vietnam to the Chinese border and from the Gulf of Tonkin to the Burmese frontier. This Group's rescue and recovery mission in SEA reflected the expertise and gallantry, which earned their Presidential Unit Citation. In a White House ceremony on 10 March, this unit was cited for rescuing 339 friendly troops, of whom 304 were saved from almost certain capture by hostile forces from 1 August 1965 to 30 June 1966.

Assigned to the Pacific Aerospace Rescue and Recovery Center (MAC), the 3d ARRG was under operational control of the Commander, Seventh Air Force. As Search and Rescue (SAR) Coordinator for the SEA Subregion, the Commander, 7AF maintained the Joint SAR Center (JSARC), under his Directorate of Aerospace Rescue (Commander, 3d ARRG) at Tan Son Nhut AB. The JSARC was the central coordination agency for all SAR activity within the SEA Subregion; it had three Rescue Coordination Centers (RCCs) under its control at Da Nang AB, RVN, Udorn and Don Muang Air Bases, Thailand. 50/

As of 31 March 1967, the 3d ARRG, including all squadrons and detachments, had a total manpower authorization of 1,227 versus 966 assigned. Aircraft

being operated by units within the Group consisted of conventional and rotary winged types. The conventional types consisted of the HU-16B "Albatross" and the HC-130H/P "Hercules"; rotary wing type aircraft were two models of helicopters: the HH-3E and HH-43B/F. The five HU-16s, assigned to the 37th Aerospace Rescue and Recovery Squadron (ARRS), were reassigned to the 33d ARRS effective 1 April, with the phaseout completed on 8 May. The force's composition was altered significantly with the change from HU-16 operation to HH-3Es, as primary rescue vehicles for the 37th ARRS in the Gulf of Tonkin. Major gains were six HH-3Es and five HC-130Ps. The total inventory on 30 June was as follows: 51/

Aircraft Type/Series	Authorized	Assigned
HH-3E	22	16
HH-43B/F	32	30
HC-130H/P	11	11
TOTAL	65	57

Combat Rescue Mission

To accomplish the combat rescue mission, HH-3E helicopters were placed on strip alert at Udorn, Nakhon Phanom, and forward operating locations, so as to be immediately available should an aircraft go down. HC-130P aircraft from Udorn flew daylight orbit over northern Thailand, carrying an Airborne Mission Commander (AMC), who was prepared to assume control of the SAR Task Force when it was launched. HU-16Bs from Da Nang flew daylight orbit off the coast of NVN, landed (if sea conditions permitted), and recovered the downed airmen, or remained over their position while the AMC coordinated the recovery

by helicopter or ship. The JSARC also had operational control of eight A-1Es of the 602d Tactical Fighter Squadron based at Udorn, and these aircraft were diverted from orbit or scrambled from alert base when a SAR mission broke. Two A-1Es (Sandys) escorted two HH-3Es (Jolly Green Giants) to the SAR scene, while two other A-1Es proceeded to the incident site to locate and protect the survivors. Navy A-1 Role of Escort (RESCORT) aircraft were provided in the Gulf of Tonkin and Navy helicopters and ships were available for SAR operations as required. 52/

Personnel Saved

During the first six months of 1967, there were 182 combat saves (resulting from action by hostile forces or personnel retrieved from a hostile area), and 112 noncombat saves (those resulting from incidents not directly caused by hostile actions and a hostile environment). The monthly breakdown was: 53/

MONTH	COMBAT SAVES	NONCOMBAT SAVES
January	9	24
February	40	6
March	61	9
April	11	5
May	31	56
June	30	12
TOTAL	182	112

During the period 1 December 1964 through 30 June 1967, there were 725 combat and 214 noncombat saves in SEA. Combat saves by country during this

period were: North Vietnam - 54; SVN - 447; Laos - 140; Thailand - 13; and Gulf of Tonkin -71. (All were military personnel with the exception of 8 civilians.) 54/

Combat Aircrew Recovery Aircraft

In May 1967, the 3d ARRG prepared a study showing an urgent need for the accelerated development of an aircraft, which could fully satisfy the unique and distinct combat aircrew recovery mission of the USAF. The purpose of this report was to justify or alter performance parameters specified in Requirements Action Directive (RAD) 7-39-(1). A complete briefing on this subject was also given to President Lyndon B. Johnson's Science Advisory Committee. 55/

Experience in SEA had shown that current peacetime equipment could not adequately accomplish wartime SAR activities. An aircraft system--Combat Aircrew Recovery Aircraft (CARA)--specifically designed to perform the combat rescue role was required. Numerous expensive modifications had been incorporated in the basic cargo-transport CH-3C. The HH-3E would fulfill the near-term aircrew recovery requirement, but it was too slow, and had reached its maximum growth potential. High speed, penetration aid (ECM) and aerial retrieval were required for rescue missions in heavily populated areas of North Vietnam. Numerous airmen downed in the vicinity of Hanoi were denied rescue effort, because the distance from the Lima Site-36 staging area was too great for slow helicopters to arrive in time, and the defense too great for penetration without an ECM capability. The Gulf of Tonkin coastline and the DMZ presented similar problems. The large number of airmen not recovered in these areas, and the relatively few saves emphasized the inadequacy of the

HH-3E in a combat scene.[56]

From March 1966 through February 1967, the 3d ARRG achieved a 36.8 percent recovery rate of all out-of-country downed airmen, compared to 89 percent who were recoverable; i.e., 89 percent successfully survived a bail out or crash landing (419 men out of a total of 470 airmen). A SAR effort was attempted for only 222 of the 419 downed airmen, after taking into consideration the time it would take to get to the scene; permissiveness of the area; and the weather. Of the 222 attempted SAR missions, 173 were successful. Of the 49 nonrescues, 23 mission failures were directly attributed to lack of speed, either in getting to the man before he was captured or killed, or darkness fell. A downed airman stood a very good chance of rescue with present forces, if he did not bail out over a heavily populated area, and the rescue aircraft could get to him in 15 minutes. Chances of survival lessened with time--if it took SAR forces more than 30 minutes, the airman's chance of recovery rapidly deteriorated.[57]

Firm requirements for CARA were high speed, the latest and most effective ECM, a maximum of 15 PSF downwash, an integrated night recovery system, a steep 45-degree approach capability, an aerial retrieval system, armor/armament, superior low speed, and low altitude maneuverability. It was also recommended that design studies include the concept of CARA providing its own fire suppression. This would minimize the force required for SAR effort and decrease reaction time.[58]

SAR Limitations

Until a new aircraft solely designed for the unique combat rescue role was made available, the following measures were being taken to minimize major limitations in recovering downed airmen in SEA. Slow speed was the greatest single factor causing failure of SAR missions. This limitation also permitted the enemy to set up defenses or traps against SAR forces. To minimize this handicap, Forward Operating Locations for strip alert were to be utilized as close to the North Vietnam borders as security permitted. In June 1967, HH-3E helicopters would begin orbiting in the Gulf of Tonkin, and on the western borders of North Vietnam during high strike periods. HH-53Bs would begin operating out of Northern Laos late in the summer of 1967, and these helicopters would reduce the HH-3E reaction time by 20 percent, because of the increased speed of the HH-53B. 59/

To improve the SAR capability in highly defended areas, new tactics were devised to counter MIG attacks and to penetrate those areas under cover of darkness by use of terrain avoidance radar. Steps were also taken to minimize time delays in obtaining a sufficient number of high performance fighter aircraft to provide continuous MIG cover. A new Southeast Asia Operational Requirement (SEAOR) ECM for SAR HH-3E/53B, HC-130P, and A-1E aircraft had been requested. Visual reconnaissance countermeasures (Laser) were also required to counter visual or optical-aimed weapons. 60/

Late strike times did not allow SAR forces sufficient daylight to arrive in the area and effect pick-up before darkness; currently only a minimal night recovery capability existed. A training program was scheduled for

JOLLY GREEN GIANT AIR-TO-AIR REFUELING

FIGURE 6

newly approved night recovery procedures, which involved the use of flares. These procedures provided only a limited capability and then only in permissive areas. To increase SAR results, a SEAOR Fiscal Year 1967, for a night SAR capability had been forwarded to the CSAF for expedited action. 61/

The first operational mission to utilize the air-to-air refueling capability of the HH-3E helicopter and the HC-130P tanker was accomplished in the Gulf of Tonkin on 21 June. The Jolly Green from the 37th ARRS flew the north orbit mission formerly performed by the HU-16B; it was refueled twice in flight by an HC-130P of the 39th ARRS. Employment of this new concept enhanced the rescue capability of SAR forces by gaining an almost unlimited range, flight time, and versatility of the helicopter in one package. 62/

The hovering helicopter (15-35 minutes was the average hover pickup time), was particularly vulnerable to ground fire, and this had forced some missions to terminate. New tactics for more effective fire suppression techniques were being devised, including use of a riot control agent (CS). MACV approved riot control agents in South Vietnam for use in rescue and recovery missions. A-1E aircraft could carry 12 dispensers, each containing 528 bomblets. After impact, the bomblets disseminated the agent, while being propelled along the jungle floor by thrust from the burning CS pyrotechnic mix. Release of 4 to 6 dispensers would cover about 2 1/2 acres with effective agent concentration one minute after dissemination, lasting 5 to 30 minutes depending on the specific condition. From 2 to 15 minutes after receiving fresh air, an incapacitated hostile might recover effectiveness. Use of this agent against unmasked enemy troops firing on SAR aircraft from hidden jungle positions

should suppress them effectively, while the recovery helicopter is committed to the pickup position. The position of the downed airmen would first have to be pinpointed as they would be incapacitated and unable to assist in the rescue effort. The masked pararescueman aboard the recovery helicopter would be lowered to the ground to help survivors find and board the forest penetrator seat. A-1Es would be able to sanitize most areas sufficiently, with the exception of masked hostiles, so that enemy forces would be unable to interfere with rescue operations. 63/

HERBICIDE OPERATIONS

The Herbicide Program showed a marked increase in targeting requirements, operational commitments, and herbicide production and delivery in the first six months of 1967. Aerial defoliation and crop destruction missions remained the responsibility of the 12th Air Commando Squadron (RANCH HAND) with headquarters at Bien Hoa. Large area defoliation missions were flown in accordance with the State/DOD-approved FARMGATE concept, which allowed use of VNAF markings on the spray aircraft, and a VNAF observer as part of the crew. Smaller spray operations were usually done by the U.S. Army, or the VNAF. Beginning in October 1966, RANCH HAND acquired the secondary mission of spraying insecticide for the control of malaria-carrying mosquitoes. 64/

On 30 January, a RANCH HAND C-123 spray aircraft was lost to ground fire on an approved defoliation target in Laos. The aircraft crashed approximately ten miles southeast of Tchepone, while on a spray run. All five crewmen were killed and the aircraft destroyed. This was the first defoliation aircraft lost in Laos (two were lost in SVN), and the first KIA in the Herbicide Program which began in 1961. In May, the pilot of an UC-123 aircraft was

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JUNGLE PENETRATOR
FIGURE 7

UNCLASSIFIED

killed by enemy ground fire in Vinh Binh Province. 65/

Herbicide Shortage

The herbicide shortage, which developed during the latter part of 1966, continued into the new year. The original requirement of 5.62 million gallons for FY 1967, had been revised upward to 6.44 million gallons in December 1966. Aerial spray operations were reduced below aircraft sortie capability to stay within this revised requirement. In December, COMUSMACV also had requested that FY 1968 herbicidal requirements be increased from 8.44 million to 11.9 million gallons, and the number of aircraft increased from 18 to 24. This would provide the capability to cover approximately 4 million acres for defoliation or food denial. However, increased requests for herbicide operations in South Vietnam and Laos, during the early part of 1967, established valid target area requirements in excess of that which could be covered by 11.9 million gallons. These targets also would require sorties in excess of the projected aircraft capability. 66/

Based on limitations of aircraft availability and agent production capability, MACV, in February, accepted 9,048,420 gallons of herbicide as the FY 1968 program and 11.9 million gallons for FY 1969. In April, however, JCS provided an estimate of herbicide available for delivery by month and type to SEA for FY 1968, totaling 8.711 million gallons of all types. Additionally, an objective of 11.516 million gallons was established for FY 1969 which, if provided, would satisfy the bulk of the established MACV requirement of 11.9 million gallons. The FY 1969 estimates were contingent upon DOD facility expansion and production capability. 67/

Herbicide requirements were subject to further revision, and JCS subsequently informed CINCPAC, anticipated SEA deliveries during July 1967 - June 1968 were approximately 9,300,000 gallons (orange and white). This would exceed the MACV requirement, although there would be a shortfall in the first few months of the period. These deliveries were possible only by an extreme impact on commercial requirements, and JCS stated there were no assurances the present DOD preemption of U.S. production would be extended beyond 31 March 1968. It appeared that maximum deliveries, which could be made during 1969, would be approximately 6,300,000. 68/

The inability to meet programmed herbicide rates in SEA was a matter of concern at all echelons. The Commander, 7AF, informed COMUSMACV the acquisition of new empirical data invalidated the planning factor of 1.2 sorties per day per assigned aircraft as established in October 1966. He recommended that planning factors for procurement of herbicide, to be dispensed by RANCH HAND aircraft, be scaled to a point where they were compatible with the 7AF capability. An analysis of past herbicide operations made by 7AF revealed that 20 - 25 percent of all chemical sorties were ineffective due to factors beyond Air Force control. During the period April - June 1967, 484 sorties had been lost to weather and 111 to battle damage. From October - June 1967, the collective sortie rate was 1.00 per day per possessed aircraft and .90 per day per assigned aircraft. This figure was well below the 1.33 sortie rate used by COMUSMACV for computing herbicide procurement. The Commander, 7AF, stated that a sortie rate of 1.00 per possessed aircraft appeared to be the planning factor, which should be applied for future operations. 69/

Sortie Rate

COMUSMACV replied that due to increased demand, the RANCH HAND effective sortie rate could not remain at the current level. The 1.2 sortie rate established in October 1966, had formed the basis for computing herbicide requirements at 1.33 sorties per day per assigned aircraft. COMUSMACV had ordered eight spray systems to be used in helicopters which would supplement the C-123 sorties in target areas inaccessible to C-123 aircraft. The helicopter sorties would use the herbicide available after the basic 1.2 sortie rate had been flown by RANCH HAND aircraft. Other measures which should increase the RANCH HAND capability were the establishment of two herbicide reloading points in the II CTZ to reduce flying time and to increase support, increased maintenance support, and the acquisition of C-123K aircraft requested by 7AF.

Adequate support had been requested for the RANCH HAND operation to achieve a performance equivalent to 1.2 sorties per day per aircraft for 17 C-123s currently assigned to the program. 70/

Project PINK ROSE

Project PINK ROSE was a full-scale controlled jungle-burning test program conducted under the overall coordination of 7AF. Three target areas in War Zones C and D were selected in November 1966. Each target was a square box, seven kilometers on each side, which contained about 12,000 acres of heavily canopied jungle. RANCH HAND aircraft accomplished initial treatment of the area by 27 November 1966. Approximately 255 sorties and 255,000 gallons of herbicide/dessicant were expended. Both aerial reconnaissance and inspections

by ground parties confirmed good drying throughout the forest. 71/

Target C was ignited on 18 January 1967; Target A on 28 January; and Target B on 4 April. The order and dates of strikes were changed to properly phase PINK ROSE operations with concurrent ground operations. Thirty B-52 aircraft from Guam were used on each of the first two strikes. On the third strike, the B-52 force was reduced to 15 aircraft, and the target box was compressed to provide a density of incendiary bomblets three times greater than that used on the first two strikes. All strike aircraft arrived on target as planned, and were properly spaced and time-phased by MSQ-77 COMBAT SKYSPOT radar. Targets were adequately saturated within the time interval requested. 72/

Burn in Target C was ineffective; most fires did not spread farther than two feet from the ignition source. In Target A, open areas burned well--approximately 75 percent; however, crown canopy removal was negligible. In Target B, fire spread in ground cover appeared to stop for no apparent reason; the upper canopy was dead and dry but unburned. Many dead trees, both fallen and upright, burned but the overall effectiveness was negligible. From an operational standpoint, failure to remove crown canopy could only be attributed to ineffectiveness of the PINK ROSE technique. Possible causes could be: (1) Moisture content in twigs and leaves was still too high; (2) Even more dense incendiary spacing was required; (3) Insufficient fuel existed between ground and canopy crown to carry fire. 73/

The PINK ROSE technique was found too restrictive for use as a normal operational tactic and considered ineffective as a means of removing the

forest crown canopy. The 7AF recommended further testing of the PINK ROSE technique in South Vietnam, under the existing concept, be terminated. 74/

DMZ Defoliation

In October 1966, COMUSMACV had requested permission to defoliate the northern sector of the DMZ and adjacent infiltration routes in NVN. Permission was withheld, pending results in the southern DMZ. Since there were no unmanageable objections by North Vietnam, or undue concern by the International Control Commission (ICC) over defoliation operations in the southern DMZ, permission was again requested to continue them and authority was granted in June 1967. Defoliation would be carried out within certain restrictive guidelines. Operations would be limited to narrow strips along identified infiltration routes in the northern portion of the DMZ, and must avoid populated areas and damage to crops and trees. Defoliation of huge areas which might affect watersheds, or the ecological balance, or which might create the impression of laying waste to the land, was not authorized. 75/

With respect to the operational impact created by adherence to these restrictions, CINCPAC informed JCS that general purpose herbicides (orange and white) which produced acceptable results were nonspecific in action and provided a wide range of effectiveness. Restraints which prohibited killing trees precluded the use of these herbicides. Experience in SEA had shown that reduced application rates did not kill plants, and did not provide desired improvement in vertical visibility. CINCPAC stated he could comply with other restraints and still attain the desired objective. 76/

Effectiveness of Operations

In response to a MACV request for an evaluation of effectiveness of defoliation operations, the Commanding General, III MAF, reported that field commanders in areas where defoliation had been conducted rated effectiveness from marginal to excellent. There was agreement that any method, which reduced enemy cover and concealment and increased friendly observation of critical areas, was decidedly advantageous. Field commanders pointed out that defoliation operations enhanced visual observation by ground and aerial reconnaissance, improved fields of fire, interdicted LOCs, reduced enemy ambush capability, and enhanced attenuation of heat sources detectable by aerial red haze methods. All field commanders indicated a desire for a more timely and immediate response to requests submitted. 77/

Within II CTZ, the Defoliation Program was planned to clear areas along LOCs, MSRs, fire support bases, and suspected enemy bases. Defoliation in these areas improved visibility for increased unit security, enhanced visual reconnaissance, and harassed the enemy. The program consisted of ten active projects, including support of Operations FRANCIS MARION, PERSHING, and BYRD. The Defoliation Program within II CTZ had produced excellent results in increasing visibility, and more sorties were required. It was recommended that consideration be given to stationing aircraft assets in II CTZ to support its Herbicide Program. 78/

The Defoliation Program in IV CTZ was also regarded as having increased effectiveness of combat operations. An increase in the number of Traildust missions was needed to accomplish defoliation of the large number of approved

area targets in IV CTZ. Additional requested projects, if approved, would double the Defoliation Program in the next year. Defoliation in IV CTZ was used for a number of purposes, some of which were unique to operations in Delta terrain. An estimated six C-123 defoliation aircraft per day were required to support the Defoliation Program of IV Corps. 79/

COMNAVFORV viewed defoliation as contributing directly to successful operations in the Rung Sat Special Zone (RSSZ). Spraying herbicide on river banks denied the VC protective cover areas for river reconnaissance, mining, or heavy weapons attacks against shipping. Inland spraying was also valuable in exposing VC bunkers, base camps, and other installations. 80/

PSYCHOLOGICAL WARFARE

In-Country Operations

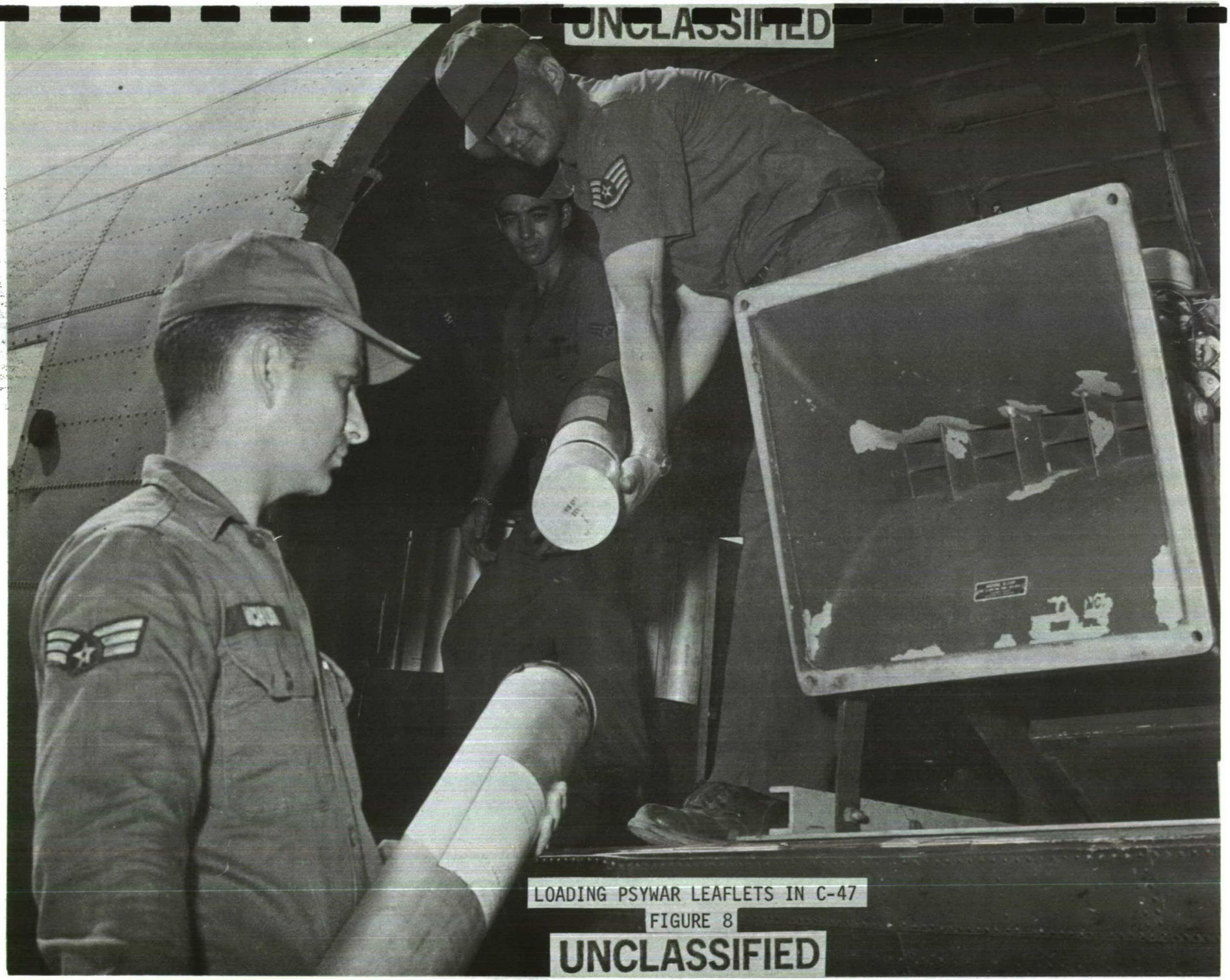
The Air Force contribution to the MACV Psychological Warfare (PSYWAR) Program consisted of leaflet drops and loudspeaker broadcasts conducted by units of the 14th Air Commando Squadron (ACS) with headquarters at Nha Trang. The 5th ACS had six C-47s and 18 U-10s to cover III and IV Corps. PSYWAR assets were significantly increased in January with formation of the 9th ACS. This squadron, with six C-47s and 18 O-2Bs, was responsible for coverage of I and II Corps. Beginning in June, O-2B aircraft of the 9th ACS replaced the U-10 aircraft of the 5th ACS at Da Nang. Replacements also would soon take place at Pleiku and Nha Trang in the ratio of two O-2Bs for one U-10. The replaced U-10 aircraft would be relocated at Bien Hoa and Binh Thuy. Seven additional O-2Bs were scheduled to deploy by the end of October. The

O-2B Super Skymaster was a twin-engined, night and all-weather configured and equipped aircraft with an 1,800-watt loudspeaker, which was the most powerful system in the psychological operations (PSYOPS) units. It was capable of dropping 200,000 leaflets per sortie, or twice as many as the U-10, with missions varied from two to four hours. 81/

The U-10 aircraft normally staged out of a forward landing strip, where an advanced supply of leaflets had been prepositioned. The normal sortie length was approximately one hour, and speaker time varied from 15 to 30 minutes per target area. The normal C-47 mission was approximately two to three hours in duration. Generally, much of the time was spent going to and from the target area. The C-47 usually dispensed two - three million leaflets per mission and loudspeaker time ran from 0 - 30 minutes per average area. 82/

As a result of the increased PSYWAR assets and the Tet campaign, a record number of 204,721,000 leaflets were dropped in SVN by USAF, Army, and VNAF aircraft in January. This figure increased to 410 million in February, when the Tet campaign reached its peak. The number of sorties rose from 2,138 to 2,346, and the number of aerial loudspeaker broadcasts increased from 755 hours in January to 950 hours in February 1967. 83/

The average monthly leaflet drop during the first quarter of 1967 was 320.5 million compared to the 1966 average of 125.1 million. Aerial loudspeaker hours reached a new high of 995 in March, as quick reaction operations received increasing emphasis and returnees were accustomed to tape



LOADING PSYWAR LEAFLETS IN C-47

FIGURE 8

messages appealing to their former comrades by name and unit. Approximately 347,600,000 leaflets were dropped during the month. The Australian Task Force dropped 983,000 leaflets during the last week in March--the first known occasion when Free World Military Assistance Forces (FWMAF) units dropped leaflets with their organic aircraft. These efforts were supplemented by ground/waterborne loudspeaker broadcasts and hand distribution of leaflets. 84/

During April, sorties flown reached a peak of 2,533 including leaflet and loudspeaker missions of the Royal Australian Air Force in direct support of the 1st Australian Task Force. Leaflets dropped totaled 387,746,700, and there were 972 hours of loudspeaker broadcasts. The level of activity continued to increase during May, with 434 million leaflets dropped and 1,400 hours of loudspeaker time. 85/

Out-Country Operations

Leaflet drops over the southern part of North Vietnam were made by C-130s of the 734th Air Transportation Coordination Office (ATCO) Airlift Wing, 315th Air Division, with mission controls exercised by 7AF. Aircraft crews of the C-130s flew from Okinawa to Ubon, where they were briefed and provided ECM before departing on their missions. The aircraft were not permitted to penetrate the NVN border on the west, and on the east, they had to maintain a distance of 20 nautical miles (NM) from the coast. The C-130s were limited to flying as far north as the approximate latitude of Vinh. Plans were under consideration to extend the C-130 coverage farther north, so that F-4s could concentrate on the Red River Delta; however, this would make the

C-130 more vulnerable to MIG encounters. The aircraft payload was about 24,000 pounds which, depending on leaflet size, was 10 - 16 million leaflets. Excellent coverage had been obtained in the C-130 target area, with an average monthly drop of 45 million leaflets. 86/

The Red River Delta was the primary target area of F-4s from the 8th Tactical Fighter Wing at Ubon. These aircraft were fragged by 7AF when weather conditions were favorable. They were not permitted to penetrate high-threat areas such as SAM sites. The F-4s dropped an average of 18 million leaflets per month. Future plans called for 100 million leaflets to be distributed over all North Vietnam. Additional F-4s would be required to meet these goals. The 7AF also proposed that C-130s make two flights instead of one flight per night. 87/

In addition to the Fact Sheet and TALLY HO drops over North Vietnam, approximately 68,345,000 leaflets were dropped over the Ho Chi Minh trail (Trail Program) during the first six months of 1967. 88/

TACTICAL AIRLIFT OPERATIONS

Mission Accomplishments

The responsiveness, reliability, and efficiency of the tactical airlift system significantly increased during January - June 1967. The 834th Air Division, activated at Tan Son Nhut AB on 15 October 1966, retained responsibility for conducting the largest sustained tactical airlift operation in history. Its mission included airland and airborne operations, and resupply and aeromedical evacuation and defoliation. 89/

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AIRLIFT OF VIETNAMESE TROOPS

FIGURE 9

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By June, the total tonnage airlifted in Vietnam exceeded the figure set during the Berlin airlift. During January 1965 to 30 June 1967, the tonnage airlifted in Vietnam was 1,848,737 tons compared to 1,784,000 tons during the Berlin blockade. A breakdown of the January - June 1967 tonnage follows: 90/

AIRCRAFT	SORTIES	PASSENGERS	CARGO TONS	TOTAL TONS
C-7A	77,248	542,639	46,274	111,392
C-123	51,700	433,984	91,284	143,417
C-130	56,377	729,566	240,171	327,720
TOTAL	185,325	1,706,189	377,729	582,529

C-7A Caribou

Until control of the C-7A was transferred from the Army on 1 January, the Air Force did not have any aircraft in Vietnam with a capability for short takeoffs and landings on small, unimproved strips, with the exception of the C-123. With a full load, the Caribou could take off and clear a 50-foot obstacle in 1,220 feet and land in 1,000 feet. The transfer of the C-7As was made to consolidate fixed-wing airlift in Vietnam under a single service. 91/

The 85 Caribou were assigned to the 483d Tactical Airlift Wing at Cam Ranh Bay, which had six C-7A tactical airlift squadrons: two at Cam Ranh Bay, two at Phu Cat, and two at Vung Tau. The Wing also provided aircraft at six operating locations with U.S. forces. At the time of takeover, the C-7A had been far below Air Force maintenance standards. But in the first four months of operation, the Operational Readiness (OR) rate climbed from 65 to 75 percent; the Not Operationally Ready-Maintenance (NORM) rate decreased

from 26 to 21 percent, and the Not Operationally Ready-Supply (NORS) rate from 9 to 3 percent.[92/]

During the first month under Air Force control, the C-7As exceeded all statistical records established in December, when the Army had control of 95 Caribou. In January, a goal of 19,000 tons per month by the end of calendar year 1967 was established. The goal was exceeded in March; however, the Caribou was overflying the program. Accordingly, approval was received to increase the C-7A utilization rate from 2.5 to 3.0 hours per aircraft per day. In May, 20,457 tons were airlifted--a record for one month of Caribou operation in Vietnam.[93/]

Action was taken during April to integrate the C-7A program into the centralized airlift command and control system on an incremental basis. Under this system, Army users proccessed C-7A cargo and passengers through the 834th Air Defense (AD) aerial ports, when available. The communications and facilities of the airlift control net were used to provide centralized coordination for aircraft processing and dissemination of mission information. Eventually the majority of all C-7As would be included in this system; however, dispersed mission site operation was necessary to economically meet user requirements on a timely and reliable basis. The ground forces had a valid need for unscheduled incidental airlift support, similar to that provided by Air Force base support aircraft. By utilizing the C-7A, the Air Force had proved that it could and would provide such support to ground forces.[94/]

C-123 Provider

In the past, the 315th Air Commando Wing Headquarters and two of its airlift squadrons had been located at Tan Son Nhut AB with another squadron at Da Nang and one at Nha Trang. Each of these locations had been a major cargo generation point. To reduce congestion in the Saigon area, the Wing headquarters and three of its squadrons were consolidated at Phan Rang in June, leaving one squadron at Tan Son Nhut and placing aircraft on operating location at Da Nang. This move proved to be more costly in terms of capability and efficiency than expected, since Phan Rang was not a major cargo generation point and extensive positioning and depositioning sorties were required. 95/

An aircraft model conversion program, involving all C-123 aircraft, was underway during this period. The conversion from B to K models was expected to continue through most of Fiscal Year 1968. The requirement to keep B models in the pipeline would reduce the number of aircraft available for missions; also, the number of UE aircraft had been reduced from 64 to 60, which reduced the C-123 flying-hour capability. Modification involved addition of two J-85 jet engines, pod-mounted to the underside of the outboard wing panel. This modification resulted in an improved safety factor under normal and emergency conditions. The power increase of modified aircraft permitted greater employment flexibility. When operating from minimum length runways, the C-123K was, in some instances, able to lift approximately double the load that could be accommodated by the C-123B. For planning purposes, the overall use of the jet would equate to approximately 60 percent of the flying hour program. This usage far exceeded that originally planned, and

the effects would be keenly felt in spare parts support, engine life, and maintenance. 96/

Communications

An inadequate communication network, resulting in ineffective control of the entire system, was pointed out by the 834th AD Commander as a major problem area. Initially, there were only five HF/SSB radios for ten operation locations, and VHF/UHF equipment was borrowed from other USAF or Army units. After the Division was activated, PACAF placed some HF/SSB, VHF/UHF, teletype, and a number of "hot line" circuits into the Division's structure. In late May, a communication operational concept was approved by PACAF, which called for a voice net allowing any subscriber to talk to another subscriber. The division headquarters, all wings, squadrons, aerial port units, and some Tactical Airlift Liaison Officers were connected into the Airlift Control Center (ACC) and its accompanying elements. Since this plan would not be fully implemented for some time, communications remained a limiting factor to effective and efficient use of airlift resources. 97/

There was also a pressing requirement for a real-time, data processing system to handle the mass of information needed to efficiently operate the RVN tactical airlift system. The present rate of 1,000 - 1,100 airlift sorties per day with a 40-minute average sortie length had saturated the existing manual data command and control system. A requirement existed for an Airlift Command Center (ALCC) subsystem which would provide automatic data transfer, storage, retrieval, and display in near real-time with secure digital data communications between the ALCC and sub-elements of the system

with which it must communicate.[98]

Aerial Port Operations

Major problem areas in port operations were reduced through improvements in equipment, facilities, organization, and manpower. The unsatisfactory condition of the materiel handling equipment, both quantitatively and qualitatively, was one of the most serious problems. Action was taken to increase authorizations and number of vehicles on hand, and to improve the overall in-commission rate of equipment through better spare parts and maintenance support.[99]

Inadequate facilities at aerial ports necessitated processing and storing cargo in the open; expensive equipment had to operate on improperly prepared surfaces; and passenger terminals ranged from very poor to nonexistent. Additional hard surface cargo storage area was acquired at Tan Son Nhut and Nha Trang, and an open cargo holding area was added at Cam Ranh Bay. New construction at several bases improved the capability of aerial ports to process and handle cargo by providing covered areas for air freight terminals. New passenger terminals were constructed at Dong Ha, Kontum, Qui Nhon, Tuy Hoa, Bien Hoa, Phu Cat, and Cam Ranh Bay.[100]

Insufficient trained personnel was a continuing problem. Based on standards developed by a PACAF manpower team, the 2d Aerial Port Group required 2,643 personnel versus 2,435 authorized--a deficit of 208. By July 1967, the deficit was 507 (2,436 authorized versus 2,943 required). The standard approved by the PACAF team (as yet, without USAF sanction), was

one man for each 75 tons handled per month, and one man for each 1,100 passengers handled per month. The lack of qualified personnel necessitated a huge training program to upgrade or cross-train inexperienced personnel. Progress was achieved in this area, but at the expense of the aerial ports capability.[101]

The number of Combat Control Teams increased and were used extensively to mark airdrop and extraction zones, and to provide portable navigation aids and night lighting for assault strips. During unit moves, they were often the sole source controlling airlift traffic in the field. Along with combat teams, the aerial port mobility teams were a part of the required package for forward operating areas where port facilities were nonexistent. These teams, supplied with rough terrain equipment, provided a load and off-load capability in the field.[102]

Support of Ground Forces

This summarization appeared in the End of Tour report of Brig. Gen. William G. Moore, Jr.:[103]

> *"The Air Force has proved that it can and will provide ground force tactical airlift needs. Moreover, in Vietnam tactical airlift has become a life line of combat operations. It is able to move troops at will into remote and desolate locations and assure their resupply under fire."*

The first airborne assault by U.S. paratroopers since the Korean War (1950-1953), occurred on 22 February, in support of Operation JUNCTION CITY. Thirteen C-130s with 700 paratroopers of the 173d Airborne Brigade and ten

other C-130s filled with heavy equipment, rations, and ammunition took off from Bien Hoa. The first C-130 reached the drop zone at 0900H and by 0930H the 23 aircraft had completed the morning's mission. In addition to paratroopers, 189 tons of heavy equipment, and 24 tons of supplies were deposited within the drop zone. Later in the day, ten more C-130s dropped an additional 123 tons of ammunition and rations into War Zone C. The Commanding General of the 173d Airborne Brigade praised the operation as follows: 104/

> *"The parachute assault was a complete success. It was exactly on time, exactly on target, and completed rapidly. I am confident that there has never been any better jump by U.S. Forces. It is my opinion that this was the best executed in the history of U.S. combat operations."*

The type of airlift support which the Air Force provided the Army was again dramatically illustrated during Operation CEDAR FALLS. During the first day of operations, the 19th Air Commando Squadron at Tan Son Nhut airlifted 19,400 pounds of equipment and supplies, plus more than 500 troops using seven C-123s. Plans called for the mission to be completed by noon, but the job was finished three and one-half hours ahead of schedule. A total of 308 combat airlift sorties were flown by C-123 and C-130 crews during CEDAR FALLS. These sorties produced a payload weighing 1,780 tons, consisting of 2,701 troops and 1,456 tons of combat cargo. 105/

The largest unit move in the history of the war took place during April, when the 196th Light Infantry Brigade was airlifted from Tay Ninh, where it had been engaged in Operation JUNCTION CITY, north to Chu Lai in I Corps. The airlift started at 0600H on Sunday, 9 April, when the first C-130 crew

took off. Shortly before 0100H on 14 April, some 112 hours and 351 sorties later, more than 3,500 men and 4,000 tons of equipment of the 196th Light Infantry Brigade were at Chu Lai. Concurrently, about 2,000 Marines and roughly 1,500 tons of their equipment were airlifted north from Chu Lai to Da Nang for the start of Operation OREGON. 106/

CHAPTER IV

BASE DEFENSE

Security Measures

With all of South Vietnam a battlefield, providing security for fixed installations presented unique problems. The task was further complicated by the enemy being physically indistinguishable from friendly indigenous personnel. The principal threat against critical installations had been either infiltration and raids by small groups, or indirect fire from mortar or recoilless rifles. There were more than 100 installations in the critical category, including all major airfields (where 50 or more U.S. aircraft were located), POL and ammunition dumps, key communication sites, logistics/complexes, major headquarters, ports, and certain private or GVN installations which were critical to U.S. operations. There were many other fixed installations which were not in the critical category, but had a security requirement.[1/]

Providing protection against the guerrilla-type threat was accented, rather than concentrating on set-piece conventional attacks. It was also necessary to maintain a proper balance between resources allocated to carry the flight to the enemy, and those used to defend U.S. forces and installations against enemy attack. The following measures for defense of fixed installations were in effect:[2/]

> Countermortar radar with associated artillery.
>
> An inner and outer security belt, including free fire areas, maximum use of perimeter fencing, ambush and listening posts, perimeter lights, armored guard towers, seismic devices, revetted guard posts, and maximum use of sentry dog teams.

- Guards armed with a wide variety of weapons.
- Special reaction forces.
- Airborne flareships and helicopter light ships to provide illumination.
- Random harassment and interdiction fire.
- Helicopter gunships on standby alert.
- Revetments and protective bunkers to reduce damage.
- Tight controls over indigenous laborers.

Command policy required support installations to provide their own internal security, and only in exceptional cases had U.S. tactical troops been diverted to a security role. Normally, tactical troops were used as reaction forces for the purpose of supporting or relieving an installation that had come under attack. The purpose of this policy was to release combat units for tactical operations against enemy field units; otherwise the U.S. effort in Vietnam would be limited to a perpetual static defense, with no possibility of military success. Despite the rapid buildup and large number of fixed installations, the enemy had occasionally been able to penetrate a local security of fixed installations. The following requirements existed to improve security:

- An improved and larger number of countermortar radars.
- Effective anti-intrusion devices, which currently were not available in-country.
- Additional physical security companies and air base defense packages.

- An easy-to-install revetment for aircraft, especially helicopters.
- Increased MCA funding for security construction.
- Increased numbers of night-viewing devices; additional searchlights; and Rome plows for clearing operations.

Until our forces succeeded in clearing large areas of enemy main forces, destroying the guerrilla and VC infrastructure, and moving on to support revolutionary development activities, there could be no positive assurance that other damaging attacks against U.S. installations would not occur.[3/]

AC-47 Aircraft

The increase in an enemy artillery capability (40-mm rockets, etc.), combined with aircraft losses and unit manning deficiencies, made it necessary to reassess the AC-47 program. The number of AC-47s available in South Vietnam was considered inadequate, and it was recommended that this capability be increased from 22 to 32. In addition, the Moonshine Mission utilized PSY WAR C-47 aircraft to augment the AC-47 aircraft in their flare-dropping role. This program was implemented to provide an additional illumination capability from 2200 to 0300 hours daily. Bases provided this support were Pleiku, Nha Trang, and Bien Hoa.[4/]

Base Attacks

A MACV Intelligence analysis of 55 VC/NVA airfield attacks from 5 April 1966 to 12 May 1967 revealed the following significant characteristics: The enemy preferred to attack at night, with most attacks taking

place between 2300 and 0300 hours. Although attacks occurred throughout the week, Sunday was preferred. Prior to an attack, the VC NVA conducted an extensive reconnaissance of the objective and its surrounding areas. The following factors probably were considered in selecting a target: its strategic or tactical importance; routes of approach and withdrawal; suitability of the surrounding area for deployment of weapons to be used; and reaction time and defensive capability of the defending force. The enemy used prepared positions and spent only the minimum period of time necessary to accomplish the mission.[5/]

Binh Thuy Air Base

Since the 24 December 1966 attacks on Binh Thuy, VC activity in that area had been limited to watchtower and outpost harassment, road blocks, and mining of provincial routes. Then on 12 January, a 75-mm recoilless rifle attack commenced against the base at 0140H and terminated at 0155H. Nine USAF personnel were injured in action but none required hospitalization. Five aircraft received minor shrapnel damage, and there was also some damage to facilities and material.[6/]

At 0240 hours on 7 February, the base was again subjected to a VC attack. No USAF personnel were killed or wounded; 11 aircraft were damaged but they could be repaired at Binh Thuy. There was also some damage to facilities and equipment. A report had been received at approximately 2105 hours on 6 February, of VC activity in the area from which the attack was initiated. Considerable effort was made to provide action against the VC, should they be in the area as reported. Such a short time

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BINH THUY AB ATTACK
FIGURE 10

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elapsed between sighting them, and the time the area was reported as having been searched, that it was doubtful if ARVN personnel did a thorough reconnoitering job, or if one was done at all, in view of the TET holiday atmosphere.[7/]

Because of previous attacks against Binh Thuy AB in December, January, and February, the March attack did not come as a surprise. Intelligence reports indicated attacks had been planned on three separate dates during March but airstrikes, artillery barrages, and ground operations caused all three to be canceled. At 0006 hours on 27 March, a 75-mm recoilless rifle attack was launched against the base. Simultaneously, a 57-mm recoilless rifle attack was launched from the same location against GVN resources at Phong Phu in a move designed to hamper retaliation. Contrary to normal VC practice, the attack was conducted during a full moon with very scattered clouds. USAF AC-47s, O-1s, and VNAF AIG/Hs were quickly airborne, and were joined by VNAF helicopters and F-100s. All aircraft expended ammunition over the target area, but by 0330 hours, a heavy ground fog developed and curtailed air activity. Ground force operations in the target area began at 0700 hours and continued until 1200 hours, but no contact was made with the VC. There were no casualties among U.S. or VNAF personnel; two HH-43Fs, however, received major shrapnel damage and two quonset huts were slightly damaged by it.[8/]

Still another attack against Binh Thuy occurred at 2250 hours on 7 May 1967. The recoilless rifle attack, involving some 200 VC, lasted

until 2300 hours. There were four USAF aircraft damaged; two VNAF H-34s were totally destroyed; two H-34s received major damage; and ten received minor damage. One VNAF O-1 received minor damage; four A-1s were totally destroyed; five A-1s received major damage; and seven A-1s received light damage. USAF dining and billeting facilities, VNAF hangars, and vehicles also were damaged.[9/]

Pleiku-Holloway Airfield

For approximately six months prior to simultaneous attacks against Pleiku AB and Camp Holloway in January, the VC had been active in Pleiku Province. On 7 January, at 0142 hours, an enemy force of approximately 200-260 personnel attacked Camp Holloway Airfield, employing a ground assault supported by mortar. Enemy secondary attacks were launched against Pleiku Air Base and Lac Trung Subsector at the same time. The enemy mortars delivered 207 rounds of 81-mm mortar fire from 10 positions within a 20-minute period. Elements of the ground assault penetrated to the center of Camp Holloway, where they employed satchel charges and grenades. Artillery, armed helicopters, and flareships supported the defense. The next day, enemy forces attacked the camp again, employing small arms and mortar fire and rifle grenades. There were no U.S. casualties and no damage to aircraft.[10/]

DaNang Air Base

At approximately 0310 hours on 27 February, DaNang Air Base and the adjacent village of Ap Po were subjected to attack by enemy fire, which was later identified as Russian-made 140-mm rockets. The attack lasted

less than one minute and during this time, an estimated 64 rounds hit the airfield and village. The attack left DaNang Air Base without electrical power and started large fires in the adjacent village. Fifty-six craters were found within the DaNang Air Base complex and eight in the village of Ap Po. The casualties were 11 U.S. killed, 29 hospitalized, and 96 treated and released. Thirteen aircraft were damaged, but some of the damage was light, being repaired within a few hours. The eight rounds which struck the village of Ap Po inflicted an estimated 85 casualties, consisting of 35 KIA and 50 WIA. The 140-mm rockets used in this attack released a tremendous amount of shrapnel on detonation; this was a new experience with mortars. One of the lessons learned was to have all living quarters and guard posts sandbagged for four-sided protection. US/RVN forces, responsible for the exterior security of this installation, subsequently extended their "protective screen" to the maximum range of this weapon, to preclude or substantially minimize the chance of a recurring attack of this nature.[11/]

Intelligence revealed that the special NVA unit which launched the 27 February rocket attack fled into the Ba Na Mountains with the launchers and ammunition. U.S. officials believed another attack was imminent, and completed a thorough search and destroy mission in the area of the original launching site, with negative results. At approximately 0200 hours, on 15 March, DaNang AB was again subjected to a 140-mm rocket attack. The duration of the attack was less than 35 seconds and an estimated 10 rounds hit the airfield proper. One rocket struck the POL tank line and caused a

large fire, but it was contained in a concrete drainage ditch and quickly extinguished. There were no U.S. casualties; two aircraft sustained damage.[12/]

Bien Hoa Air Base

At approximately 0101 hours on 12 May 1967, Bien Hoa Air Base and the surrounding area was subjected to an attack by 82-mm mortars, 75-mm recoilless rifles, and 122.4-mm rockets. The enemy expended 203 rounds during the nine-minute attack. The base received 189 known hits and 14 known hits were received off base. U.S. casualties were 6 killed, 23 hospitalized, and 54 treated and released.[13/]

Defense against this type of attack was extremely difficult. The ability of the Viet Cong to advance within mortar/rocket striking distance was limitless. Increased external base security at Bien Hoa was considered mandatory. Increased ambush sites and night patrols were required, and an air recon and reaction capability was considered a necessity.[14/]

An explosion and a fire occurred in the napalm area of Bien Hoa Air Base on 8 February, as the result of enemy sabotage. There were no casualties but a total of $342,000 of napalm was destroyed. Records indicated this was the first time this type of tactic had been used against an Air Force munitions storage area. Steps were taken to provide better security in these areas by adding guards, portable lights, and maintaining closer surveillance of indigenous personnel.[15/]

Anti-Aircraft Defense

The start of bombing attacks against North Vietnamese operational air bases aroused concern that the enemy might reciprocate with attacks

against our overcrowded SEA bases, causing disastrous consequences. In response to a CSAF request, CINCPACAF reexamined our antiaircraft defense posture in South Vietnam and Thailand. The 7AF Intelligence estimate indicated only a remote possibility of enemy air attacks against our bases, and CINCPACAF believed political considerations might deter such actions, because of the relatively small gains involved. The possibility of a low-level sneak attack for propaganda purposes, however, could not be ruled out. In such an event, DaNang appeared a likely target. North Vietnam's offensive air capability consisted of six IL-28 light bombers (plus two additional IL-28s located in southern China), and a MIG force of 64 MIG-15/17s and 18 MIG-21s limited to strafing attacks. Limitations of the enemy's offensive air capability might render such attacks militarily unfeasible, but the possibility existed that MIGs could attack with bombs by using staging bases in southern NVN.[16/]

Radar coverage over the northern portion of South Vietnam and Thailand was adequate to satisfy the air threat posed by MIGs/IL-28s. DaNang, Udorn, Nakhon Phanom, and Ubon were considered vulnerable to surprise low-level attacks, due to adjacent mountainous terrain. A requirement existed for deployment of one Hawk Battalion each to Udorn, Ubon, and Nakhon Phanom, in that order of priority. Steps recommended for modernization of tactical air defense forces included replacement of F-102 interceptor aircraft with F-4Ds, and replacement of WW vintage radars with more modern equipment. Programs were already underway to provide revetments for tactical aircraft at vulnerable air bases. Irrespective of the degree of U.S. air defense capability and preparedness,

the enemy could conduct low-level sneak attacks with resulting damage to aircraft and facilities at one or more U.S. bases. 17/

CHAPTER V

ROLLING THUNDER

Introduction

The ROLLING THUNDER Program was intensified, due to experience gained in previous years, because of the reduction of political restraints, and the introduction of new weapons and aircraft. A definite shift of emphasis into Route Package VI also characterized this period. 1/

The ROLLING THUNDER Program applied to all of North Vietnam, with the exception of the operational area from the northern DMZ to 17°30' north, which was designated TALLY HO. The remainder of North Vietnam was subdivided into Route Packages, with the USAF and USN assigned areas of responsibility. Sortie allocations remained at 10,100 sorties per month throughout the first half of the year. 2/

The major portion of forces available for ROLLING THUNDER operations were based in Thailand. The F-105s were still the primary target aircraft being used for these operations, but they were to be replaced by F-4s in 1968. The F-104 aircraft currently used for escort duty was to be replaced by F-4s beginning in July 1967. All strikes against the Red River Delta received air-to-air refueling by means of KC-135 tankers, which were based at U-Tapao and Takhli Air Bases. During the year, Marine all-weather attack aircraft (A-6s) were made available to the ROLLING THUNDER Program in support of the Navy and Air Force effort. 3/

Operations during the first six months of 1967 were carried out under

ROLLING THUNDER Execute Orders 52 through 56. ROLLING THUNDER 52 (12 Nov 66-28 Jan 67) and ROLLING THUNDER 53 (28 Jan - 24 Feb) were issued during the height of the northeast monsoon, when weather conditions in the Red River Delta were very poor. Many of the scheduled missions were diverted into RP I and the Lao Panhandle. During periods of adverse weather in RP I, MSQ-77 strikes succeeded in maintaining a high level of strike pressure, inducing harassment and attrition throughout the critical infiltration routes, associated truck parks, and storage areas. The northwest and northeast rail lines were repeatedly struck but bypasses continued to minimize effects of these strikes. Extensive damage was inflicted on the Thai Nguyen steel mill, classification yard, and railroad trackage. Operation BOLO, executed on 2 January, simulated a typical ROLLING THUNDER strike, substituting F-4Cs for F-105s to stimulate the launch of MIG aircraft. It was the most successful counter-air operations of the air war to date and resulted in destruction of seven MIG-21s. 4/

In February, airstrikes against military targets in North Vietnam were supplemented by three other military efforts. The use of naval gunfire in NVN was extended to include all military targets being struck by aircraft. Air-delivered nonfloating mines were emplaced in selected river areas in the southern portion of North Vietnam, and firing of artillery in South Vietnam against military targets in, and north of the DMZ, was initiated. Air activity was sharply curtailed by adverse weather and the Tet standdown, 8 - 12 February. Hanoi took advantage of the truce to conduct resupply operations, which were obviously the result of extensive planning and coordination. It was estimated the enemy moved some 40,000 tons of supplies into or through

RP I; approximately 30,000 tons came by water into the Song Giang region and were subsequently transshipped; and approximately 10,000 tons were moved along Route 15 for use of NVN troops in Laos and NVN/VC units in South Vietnam. 5/

ROLLING THUNDER 54 (24 Feb - 24 Apr) offered an expanded target base but adverse weather during March hampered operations. Navy A-6As hit a number of targets by radar during periods of bad weather. The Thai Nguyen, Son Tay Army Support Depot, and Viet Tri complexes were struck by small USAF forces. The strikes forced the Thai Nguyen iron and steel complex to curtail production of bridge trusses, POL tanks and barges, although pig iron production apparently was not affected. Strikes against thermal power plants reduced their capacity for some 12-18 months. 6/

Air activity showed a marked increase during the latter part of April, as a result of improved weather. Air defense installations, transportation networks, equipment, and facilities supporting movement of troops and material to the south continued as primary targets. Operational jet airfields were attacked for the first time on 24 April. Nine U.S. aircraft were downed in aerial combat in the period 19 April to 30 April--the first losses to MIGs since December 1966. 7/

Good weather helped sustain the high level of air operations during May. Airstrikes continued to hammer at the Thai Nguyen target complex, the Hanoi repair yards, the Haiphong cement plants, and thermal power plants. North Vietnam lost 26 fighter aircraft in air combat, while the U.S. lost only two. Fifteen MIG fighters were destroyed on the ground at Kep and Hoa Lac

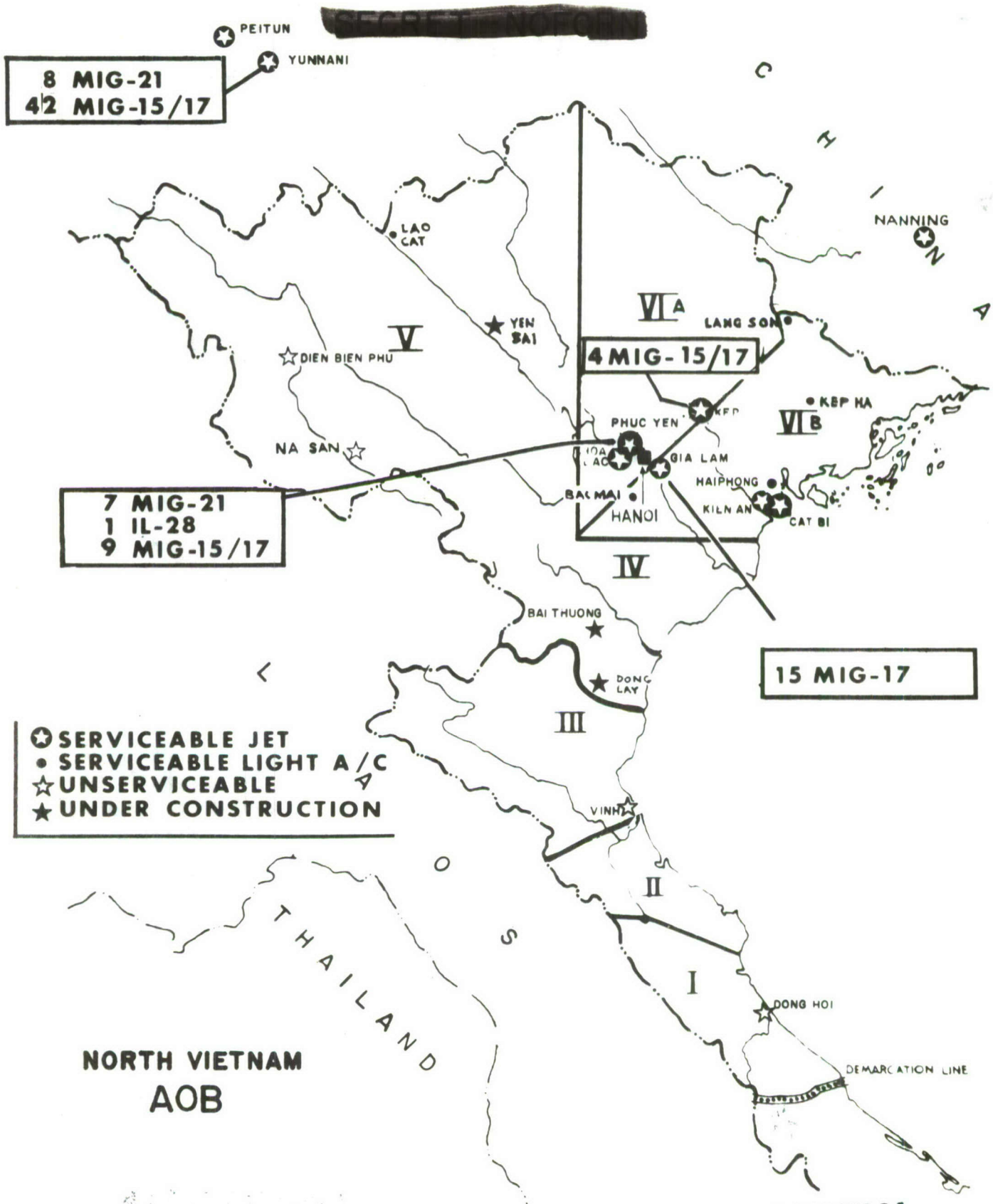
airfields. Constant pressure was maintained against road and rail targets, and watercraft in the southern portions of North Vietnam. The 48-hour truce in observance of Buddha's birthday (0600H May 22 to 0600H 24 May) had little effect on either the political or military situation. 8/

The weather was generally very favorable during June, enabling attack sorties to increase. The emphasis on rail lines, rail yards, freight cars, etc., which had started in May, continued with increasing success. North Vietnam's loss of 26 MIGs in May and five during the early part of June, undoubtedly accounted for their decreasing aggressiveness. Strikes against Hoa Lac and Kep airfields continued throughout the month and kept these airfields dormant. 9/

Program Objectives

The basic objective of the ROLLING THUNDER Program remained the same as in previous years: to reduce and disrupt the external assistance provided North Vietnam, impede or halt the southward flow of men and material, and destroy the country's war-making or supporting industries. 10/

CINCPACAF reviewed the 1966 ROLLING THUNDER operations and made targeting recommendations to CINCPAC to increase the input of operations during the first few months of 1967. Assessment of 1966 operations revealed that destruction of thousands of vehicles, hundreds of rail and highway bridges, and thousands of tons of POL had impeded movement of war materials. CINCPACAF believed that "without the disruptive effects of airpower, the Communist forces might have long since been able to marshal major forces for an all-out



NORTH VIETNAM
AOB

FIGURE 11

offensive in South Vietnam." Enemy reactions to U.S. efforts, however, had been immediate and resourceful. Pack animals and human portage were used as alternate means of transporting war materials and increased use was made of watercraft to offset loss of trucks, rolling stock, and interdicted LOCs. The enemy by-passed or quickly rebuilt destroyed bridges, dispersed remaining POL supplies, and increased imports of this vital commodity. North Vietnam's air defense system also had become increasingly sophisticated during 1966. Several factors limited U.S. ability to accomplish its objectives: poor weather for prolonged periods of time; the enemy's repair and reconstruction ability; political restraints, and geographical sanctuaries. 11/

One of the lessons learned during 1966 was a gradual, drawn-out campaign created very little psychological impact on the North Vietnamese leaders and populace. Destruction by airpower of even a few targets in the vicinity of Hanoi and Haiphong was believed to have had considerable impact. According to CINCPACAF, the task of bringing the war to the doorstep of the NVN should be continued and increased during 1967--no sanctuaries should remain around Hanoi and Haiphong. The targeting concept for the new year should be one of attacking every significant military supply target, while continuing to avoid civilian-populated areas. Exhaustion of enemy resources of men and materials, it was believed, could be accomplished by pressure on Hanoi, attrition of war material, and aggressive search and destroy operations in RVN. 12/

Targeting Concepts

Experience gained previously had shown a need for greater targeting freedom, because of the problem of enemy restoration of targets, and adverse

weather which prevented timely reattacks. A need existed for targets in the hard-to-repair category, such as power plants, port unloading machinery, and aircraft maintenance and repair facilities. Strikes in rapid succession on thermal power plants, selected industrial targets, and the Hanoi RR and highway bridge would show aggressiveness and produce the desired psychological impact. Attacks should also be directed against large supply and storage facilities in the vicinity of Hanoi and Haiphong. Attrition in depth of war supporting goods and facilities at dispersed locations along LOCs south of Hanoi/Haiphong should be continued. Occasional selective strikes at key bridges would be required to impede traffic, permit attrition of vehicles, and restrict redeployment of the labor force, but no extensive interdiction effort was anticipated. 13/

CINCPACAF believed this was an opportune time to press for a high-value target base, since the Chinese Communists (CHICOMs) were occupied with internal problems. Route Package VI was obviously the key to the enemy's war-making potential. If authority were granted for close-in attrition in the vicinity of major ports, the greatest effort would be concentrated on the Haiphong area to destroy bulk supplies, with lesser emphasis placed on the Hanoi area. To be effective, this plan required constant day and night pressure; any forces and supplies getting through the Hanoi/Haiphong campaign would be attrited elsewhere in NVN. Attacks had to be coordinated to achieve destruction of the target system in the shortest possible time, thus bringing home to Hanoi the full impact of U.S. strength and determination. 14/

In presenting his concept of operations to CINCPAC, CINCPACFLT stated

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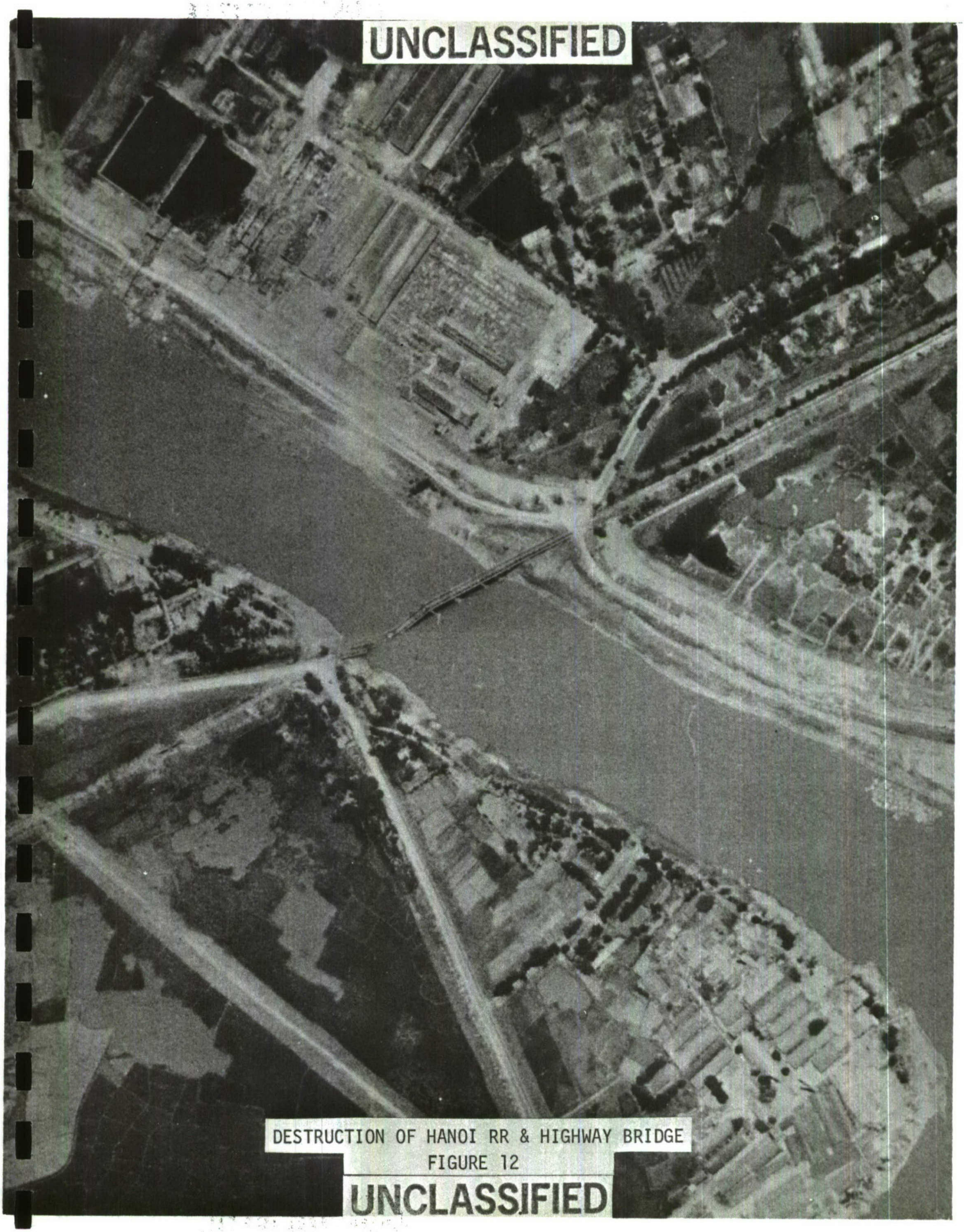

DESTRUCTION OF HANOI RR & HIGHWAY BRIDGE
FIGURE 12

UNCLASSIFIED

the broad dispersion of important targets in NVN greatly reduced the value of striking fixed targets on a random basis. The value of a target at a given time depended upon its importance as one of a small group of interrelated targets. If all targets in a particular system were destroyed, CINCPACFLT pointed out, it would effectively stop the enemy from functioning there, and force him to devise alternate means. Destruction of a hard-to-replace truck or locomotive was also more effective than cratering a road, interdicting a rail line, or destroying a bridge. Strikes should be limited to small geographic areas, as this reduced exposure of the striking force. Really significant targets involved in the interdiction program did not readily lend themselves to a fixed target list. Transient targets were struck largely as a result of pilot observation or photographic read-outs. Due to the difficulty of locating transient targets, there would always be a certain number of significant stationary targets. CINCPACFLT stated "the decision to strike fixed targets should depend on the tactical commander's analysis of the enemy's reactions and countermoves to strikes on interrelated targets of both fixed and fleeting nature." He recommended closing of the Haiphong Port as the first priority objective. If authority for this was not forthcoming, he recommended strikes against the following target systems: electric power, transportation, logistics/LOC support industries, dams, and locks. 15/

CINCPAC agreed the most effective means of impeding imports into North Vietnam was by closing or disrupting ports in the northeast quadrant. In February, he recommended to JCS authority be granted to close selected North Vietnamese ports. The closure of Haiphong Port was of paramount importance,

since it would effectively compound North Vietnam's logistic problems. Approximately 85 percent of the country's imports came through Haiphong; there were no satisfactory alternate ports, and the ability of the rail system to function as a substitute means of providing logistic support was marginal. Soviet cargo presently entering NVN through this port would have to be re-routed or offloaded by barges. CINCPAC recommended mining and air attacks against the port, since they would complement each other. If North Vietnam resorted to barge offloading operations seaward of the mine fields, this traffic would be subject to interdiction by airstrikes and additional mining. Mining and airstrikes could virtually seal Haiphong as a source of war supplies. 16/

In view of improving weather conditions over North Vietnam in April, CINCPAC informed JCS that maximum freedom of action was desired to assure application of steadily increasing pressure over the vital northeastern sector of the country. He recommended that the restricted/prohibited areas around Haiphong and Hanoi be substantially reduced, or the operating rules liberalized. No airstrikes had been conducted in Hanoi's prohibited area since early December 1966. There were 24 lucrative targets, however, within this prohibited area included in CINCPAC's proposal for future targets. CINCPAC recommended reducing the Hanoi and Haiphong restricted areas to ten NM and four NM, respectively, eliminating the prohibited area and assigning selected targets for strikes within it. (The Hanoi prohibited area was within 10 NM of the center of Hanoi; the Hanoi/Haiphong restricted areas were those within 30 NM of the center of Hanoi [excluding the Hanoi prohibited area], and within 10 NM of the center of Haiphong, with certain exceptions.) 17/

Effective 23 May, JCS directed that no "airstrikes against fixed targets within a radius of ten miles of Hanoi will be conducted without new authorization." CINCPAC recommended continuation of strikes against the type of targets that were previously authorized, particularly those in close proximity to Hanoi. The restriction, however, was not lifted during the reporting period. 18/

Implications of the air campaign in North Vietnam, if additional constraints were imposed on the overall effort, were under study. At CINCPAC's request, CINCPACAF analyzed the implications of: (1) restricting bombing to LOCs south of 20°; (2) prohibiting all strikes except expanded armed recce in RP VI outside the CHICOM buffer zone and Hanoi/Haiphong sanctuary; and (3) destroying ports and port facilities, including closing their sea accesses, but prohibiting attacks on non-LOC fixed targets. CINCPACAF stated any of these constraints, if imposed, would seriously impair effectiveness of the ROLLING THUNDER Program. At best, the third constraint would do much to deny Hanoi external assistance and impede the flow of materials, but this would be negated, to a large extent, by relaxing pressure on enemy vital war plants, internal resources, and the will to win. At worst, the U.S. would revert to a situation which had already proved less than effective. CINCPACAF believed all three cases would seriously degrade U.S. effectiveness, with no compensating improvement in losses, or in sortie requirements. It was essential to apply the following three-pronged pressure: destroy the enemy's war production/distribution plants; interdict his LOCs; and keep pressure on him in SVN, thus forcing him to use men and materiel with

diminishing hope of replacing them. 19/

The effect that implementation of Practice Nine would have upon the ROLLING THUNDER Program was considered by MACV early in the year. The Practice Nine concept proposed establishment of an anti-infiltration obstacle system across the northern portion of South Vietnam and into Laos. Once the obstacle system was installed, it was considered possible that pressure on North Vietnam would increase. If bombing were discontinued, however, North Vietnam would be free to deploy its SAMs and AAA against aircraft supporting the obstacle system. To protect these aircraft, bombing of North Vietnam had to be maintained to force Hanoi to continue deploying its SAMs in defense of the heartland. If suspension of bombing in NVN were required in the future, it would be far more acceptable to the U.S. if suspension were not applied to the extended battle area. For example, in return for certain reciprocal actions, and if considered for the best national interest, bombing north of the 19th or 20th parallel could be suspended. Current operations in the extended battle area, however, must be continued as a matter of military necessity. 20/

Northeast Quadrant

In April, CINCPAC requested CINCPACAF to develop a strike concept for the vital, highly defended area of Route Package VI, and those contiguous areas of Route Packages IV and V containing the most lucrative military targets remaining in North Vietnam. The political center, all the main industry, port facilities, airports, and major military training centers, as well as the hub of the country's transportation and communications network were

located in this area. From 1 July 1966 to 31 March 1967, sorties expended by the Air Force and Navy in RP I and Laos had been 53 percent; RP II through RP V - 39 percent; and RP VI (A&B) - 8 percent. Now the objective was to increase pressure in the vital northeast quadrant; however, any sortie allocation was to be flexible, dependent on target assignments, weather, and enemy air defense activity. Missions included strikes against some of the airfields, most of the major arteries of the rail system, a number of industrial centers, and key points within the road system. Strikes against population centers, port facilities, shipping, and the two major airfields, however, were to be avoided. 21/

The priority of tasks to achieve overall objectives within the authorized ROLLING THUNDER Program was as follows:

* Reduce, disrupt, and deny external assistance to NVN.
* Disrupt and destroy in depth those resources contributing most to aggression.
* Harass, disrupt, and impede movement of men and materials to the South.

Armed reconnaissance was to concentrate on preplanned strikes against fixed targets and search for water traffic in the coastal and inland waterways, particularly in the Haiphong area. Search for other fleeting targets was not desired in this high-risk area, except in conjunction with fixed strikes. 22/

Lines of Communication

The coordinated strike plan for improved Line of Communication (LOC) interdiction in the northeast quadrant called for PACFLT forces, armed with

Walleye weapons, to conduct strikes on selected bridges, with follow-on strikes by PACAF forces against rail yards and bottled up rolling stock. CINCPAC advised JCS on 29 June that three of the key bridges selected as prime Walleye targets, and considered essential to the success of this plan, were located within the southern portion of the CHICOM buffer zone. He recommended authority be granted to conduct Walleye strikes on these bridges, with follow-on strikes by conventionally armed forces against rail yards, and all rolling stock which was trapped on the northeast railroad south of Lang Nac Rail Bridge. 23/

The campaign against North Vietnam's railroad complex was continued and intensified in June, with outstanding results, particularly in Route Packages V and VI. The pattern of attack disrupted classification yards, sidings, and other choke points and resulted in immobilization of numerous pieces of rolling stock. In Route Packages V and VI alone, careful evaluation indicated that 986 pieces of rolling stock were either damaged or destroyed. Collateral damage was achieved by simultaneously striking the road and canal LOCs. On the northeast railroad alone, rolling stock, with an estimated capability equal to 34,000 metric tons, was destroyed. This equated to approximately 34 percent of the rail line's capability. 24/

Industrial Targets

Airstrikes against industrial targets in NVN were designed to increase the cost of the conflict for Hanoi, to reduce the economic benefits of exports, and to continue dislocation of the economy. The Hanoi regime publicly admitted that U.S. bombing had inflicted a number of difficulties. The

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THAI NGUYEN RR YARD
FIGURE 13

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economic disruption was reflected by increased imports, reduced exports, increased aid and long term loans, and the losses of rolling stock, thermal power plants, cement production facilities, and other essential industries. There was also a heavy drain on the labor force for work camps and war-supporting activities. 25/

On 24 February, ROLLING THUNDER 54 was initiated with emphasis on JCS 76.00, the Thai Nguyen iron and steel complex, and North Vietnam's power plants. The Navy was authorized to strike the Hon Gai, Bac Giang, and Haiphong power plants, while the Thai Nguyen iron and steel complex and its power plant were USAF targets. USAF strikes against the plant on 10 and 11 March involved a total force of 22 F-4Cs and 78 F-105s, which delivered 392 M-117 bombs and 56 CBU-24s. Approximately 14 percent of the plant was destroyed, and it was estimated that construction of bridge trusses, POL tanks, and barges had been curtailed; apparently pig iron production had not been affected. The Thai Nguyen power plant was hit by three F-105s carrying the MK-82, Snake-eye. Repeated Navy and Air Force strikes against the complex were carried out during ensuing months. 26/

Thermal Power Plants

North Vietnam had 12 principal thermal power plants which produced about 90 percent of the country's total electric power. Prior to the Navy strikes of 10 May, against the two Haiphong thermal power plants, eight plants located near Uong Bi, Thanh Hoa, Ben Thuy, Hon Gai, Nam Dinh, Thai Nguyen, Viet Tri and Bac Giang had been hit. The Hanoi Thermal Power Plant, struck on 19 and 21 May, had the capability of providing 17 percent of the total electric power

output of North Vietnam; it was the major energy source for Hanoi. Because of its significant output, it was decided that this plant should be taken out of operation in spite of its being situated within Hanoi. Careful precautions were taken to confine the strike to the plant itself, and to avoid damage to any nearby structures or installations. Several separate sources reported the loss of power in Hanoi after the strikes. By June, air-strikes had crippled or gutted the major thermal power plants, but portable generating plants had partially restored electric service. 27/

In June, CINCPACAF recommended that four fertilizer plants be added to the RT target list. He pointed out that shortages of this element in the economy would require import of approximately 290,000 MT during 1967. Consequently, authorization for strikes against domestic production would raise the required imports to a total which would overload rail and port facilities. There were also indications these plants might be primarily engaged in production of explosives and munitions. The large increase in fertilizer imports since 1965, gave credence to interrogation reports that these plants might be manufacturing war-supporting explosives. CINCPAC pointed out to JCS that strikes on the Viet Tri, Bac Giang, Phu Tho, Xom Thuong, and Hanoi chemical plants would disrupt North Vietnam's explosive manufacturing capability, and also force an increase in imports, which would further overload the country's rail and port facilities. 28/

POL Facilities

Strikes against the Hanoi/Haiphong POL facilities began on 29 June 1966, and efforts to destroy North Vietnam's POL supplies in major depots and

dispersed locations along the LOCs continued during the first half of 1967. By the end of June 1967, the status of POL in NVN was as follows:

JCS Targeted Cap	133,540 MT
Destroyed	115,610 MT
Remaining	17,930 MT
Disp. Cap.	70,480 MT
Destroyed	14,270 MT
Remaining	56,210 MT

Approximately 64 percent of the total storage capacity had been destroyed. Weekly imports matched requirements (4,500 - 5,000 MT), and this would continue until authority was granted to close the Haiphong Port. CINCPACAF believed that excessive aircraft and weapons would be required to successfully destroy the 56,210 MT dispersed at some 236 small installations of varying sizes. He therefore strongly recommended against including POL targets in the ROLLING THUNDER strike list. It was believed the railroad campaign would cause attrition of POL, as well as other imports. CINCPACAF considered the rolling stock campaign, attacks against LOCs thermal power plants, the residual of the iron and steel complex, and continuing harassment of Kep/Hoa Lac airfields, to be a more appropriate and gainful use of tactical forces available. 29/

Airfields

At the beginning of the year, North Vietnam was continuing its program of airfield construction. The number of its jet capable airfields had increased from four to six during the past year, with two more under construction. Of the 15 known North Vietnamese airfields, five had been hit by February 1967. Vinh, Dong Hoi, and Dien Bien Phu had been struck several times in 1965; Phu Tho and Dien Bien Phu were hit in 1966; and Bai Thuong was

attacked on 12 January 1967.[30]

CINCPAC believed the threat of an expanding complex of airfields could be countered best by striking MIGs based at Phuc Yen, Kep, and Hoa Lac. The 7AF and CINCPACFLT, respectively, authorized ROLLING THUNDER 55 strikes against Hoa Lac and Kep airfields, effective 24 April. Attacks against airfields were to be limited to small and random harassment strikes designed to attrit aircraft and disrupt support facilities. Strikes of about eight aircraft or less were considered small; however, experience had proved that small force attacks were not providing the necessary mass of weapons to damage or destroy targets. Therefore, restrictions against strike force size were rescinded, and 7AF was directed to conduct future attacks against Hoa Lac with sufficient force to cover dispersal/runway areas with the objective of achieving destruction.[31]

USAF aircraft struck Hoa Lac Airfield on 24 and 28 April, and on 1 and 3 May. CBUs and bombs impacted on the revetments at the north and south ends of the runway. The number of MIGs identified on Hoa Lac decreased from 14 on 29 April to three on 8 May. Two of the three aircraft appeared to be undersized MIG-21s and were possibly dummies.[32]

In May, CINCPAC urgently requested authority to proceed with attacks on the remaining MIG airfields. He pointed out that off-limits airdromes, such as Phuc Yen, Gia Lam, and Cat Bi made it possible for the enemy to divert aircraft to these fields when Hoa Lac, Kep, and Kien An were temporarily disrupted.

BOMBING OF HOA LAC AIRFIELD

FIGURE 14

Plans therefore called for attacks against Hoa Lac, Kien An, and Cat Bi, as well as Phuc Yen and Kep. Follow-up strikes would be conducted as required, with the objective of destroying MIGs dispersed to any NVN fields as a result of strikes against major bases. 33/

All-Weather Bombing Capability

The capability to keep pressure on NVN through around-the-clock attacks using all-weather bombing techniques was an urgent requirement. To that end, PACAF optimized the radar-bombing capability of the F-105, and exploited the all-weather capability of the F-4D and other aircraft deployed to SEA. 34/

Airstrikes were flown during February to evaluate the capability of the F-105 to deliver "iron" bombs from a level flight altitude using the R-14 Fire Control System. This system, originally designed for nuclear weapons, permitted delivery of conventional ordnance from level flight without visual contact with the target; i.e., in bad weather and at night, without flares. Although this system was not as sophisticated as the radar system in the Navy's A-6A aircraft, it had great potential and was evaluated as to its accuracy. 35/

Operation NORTH SCOPE, an evaluation, in a combat environment, of the F-105s capability to perform level bomb delivery by use of its ground mapping radar system, was started at the end of April. These aircraft were modified to improve the radar ground map resolution. Missions normally included two aircraft, the F-105F with the NORTH SCOPE configuration, and another F-105F with a Wild Weasel configuration. The missions were flown at night and

scheduled in RPs V and VI. The results were still inconclusive at that time, due to the low number of sorties flown and insufficient photo BDA for the month. 36/

Marine A-6 assets having full systems operational were also made available and employed in the ROLLING THUNDER Program in support of 7AF and CTF 77. Employment of Marine A-6s began in April, being initially coordinated with CTF 77 and then conducted in CTF areas of responsibility. At first, most of their attack sorties were flown in RP I; however, since there were other all-weather capable aircraft operating in that area, CINCPAC believed more A-6 sorties could be diverted from RP I to areas farther north. Accordingly, he informed his subordinate commands in May that Marine A-6 operations could be operated under 7AF. Targets within CTF 77 areas of responsibility suitable for A-6 attack could be assigned to 7AF in the same manner as was presently being done for normal cross-operations. Marine RF-4Bs could be used for recce support of A-6 operations when 7AF was unable to provide this support. 37/

In April, CINCPAC directed that assignment of A-6 sorties be fragged into RP VI as top priority, with secondary emphasis on other selected targets whose disruption would contribute to the overall objective. To properly utilize SVN-based A-6 resources, CINCPAC expected that only specific significant radar targets in consonance with CTF 77 objectives would be provided 7AF. That is, the CTF 77 should provide the target desired to be struck within a specific time frame, and measures should be taken to insure that those targets scheduled for attack by III MAF were actually struck. 38/

In view of the demonstrated all-weather capability of A-6 type aircraft, CINCPAC recommended to JCS in April, an increase in their number to enable U.S. forces to conduct a 24-hour air campaign. He recommended that additional A-6s be assigned to CVAs already deployed to SEA, as soon as possible by increasing the nine-plane squadrons to 15-plane squadrons. CINCPAC stated that a minimum of 30 A-6 aircraft should be aboard CVAs at Point Yankee to augment the capability for harassing and disrupting North Vietnamese targets. 39/

Destructor MK-36

CINCPAC authorized employment of Destructor MK-36 in North Vietnam on 4 February 1967. Plans called for employing the weapon in the interdiction of logistical movement of military personnel and material on inland waterways, estuaries and key land LOCs in RPs I through VI-B. Tactical aircraft would be the primary delivery method for these weapons. Initially, seeding operations were to include delivery of a token number of general purpose bombs to conceal the nature of operations. If interdiction proved successful, it was anticipated the enemy would attempt to bypass seeded areas, thus creating a need to seed additional areas. 40/

Planned production of Destructor MK-36 conversion kits for SEA would provide 500 kits by the end of June, 1,600 in July, 2,700 in August, and 3,600 per month thereafter. CINCPAC pointed out to JCS on 22 March that 5,000 units per month would be needed to implement the planned interdiction program. Accordingly, he requested that production be increased to that level. Depending on the success achieved, a further increase in the quantities of kits might be necessary. CINCPAC requested that the initial production of 500

conversion kits be consigned to CINCPACFLT for use in SEA, and that subsequent production be consigned on a five-to-one ratio to CINCPACFLT and CINCPACAF, respectively. 41/

Walleye Glide Bomb

The Walleye glide bomb was first used by the Navy in SEA on 11-12 March against the Thanh Hoa Bridge. The Walleye was a free-fall glide bomb utilizing a TV guidance system. The weapon weighed 1,100 pounds with a 450-pound charge. All three Walleye glide bombs apparently hit the bridge, but photo BDA showed no apparent damage to the target. As of March, the Thanh Hoa Railroad and Highway Bridge (JCS 14) had been attacked six times by USAF and 24 times by the USN. 42/

Assessment

During a five-week period beginning in late April, the level of damage in the northeast quadrant substantially increased, and more pressure was placed on the North Vietnamese government than during the entire previous ROLLING THUNDER Program. Twenty JCS-controlled targets were struck in this period compared with a total of 22 during 1966. In less than five weeks, 30 MIGs were destroyed in air-to-air combat, compared to 42 in the preceding 22-month period. In addition, MIG aircraft were destroyed on the ground, and three jet-capable aircraft were struck. New tactics, improved CBU-munitions and an improved ECM capability resulted in more effective operations against the northeast railway than those of last summer. On 23 May, strikes within 10 miles of Hanoi were prohibited except when specifically authorized. Since then, no new controlled JCS targets had been authorized, with the exception

of Walleye strikes against the Hanoi Thermal Power Plant. Emphasis in RP VI was now being placed on armed recce, with strikes on such fixed targets of value as were authorized for strike.[43]

The Interdiction Program was also regarded as having been highly successful since February. The import program had been hampered, port congestion was increasing, and important sectors of the industrial base had been damaged or destroyed. The following important changes had taken place since April:[44]

- MIG AOB had been reduced by 50 percent.
- SAMs were apparently being launched without effective guidance.
- AAA was less intense and less effective.
- U.S. losses were decreasing due to degraded MIG, SAM, and AAA capability.
- The enemy was experiencing resupply problems, as large amounts of food were now being imported, partly accounting for greatly increased tonnage entering ports. It was estimated that 2,000 out of 3,500 trucks destroyed in the past ten months had not been replaced, and that a net reduction of 30 percent of the railroad rolling stock had been accomplished.
- New weapons, particularly CBU-24, were available in more adequate quantities. The introduction of the Walleye added accuracy and effectiveness to strikes.

CINCPAC pointed out that these changes had occurred since early May, when the tempo of air activities in the enemy's rear support area, the Hanoi-Haiphong complex, and the northeast quadrant were stepped up. CINCPAC believed the U.S. had achieved a position:[45]

"...from which a precisely executed and incisive air campaign of depth and sustaining persistence against all the target systems will aggregate significant interrelated effect against the combined military, political, economic and psychological posture of NVN. In our judgment the enemy is now hurting and the operations to which we attribute this impact should be continued with widest latitude in planning and execution in the months of remaining good weather."

The assessment given by COMUSMACV to the American Ambassador on 20 June, emphasized some of these same points. He pointed out the war had forced Hanoi toward national, perhaps, total mobilization. The North Vietnamese economy, industrial base, and infrastructure were progressively deteriorating or being destroyed by the air and naval campaign. Approximately 85 percent of the enemy's power-generating resources, 30 percent of his railroad system, and 50 percent of his railroad repair capabilities had been destroyed. In addition, a number of large storage depots had been destroyed, and steel and cement plants had been rendered incapable of production. Approximately 3,500 trucks and 4,000 water craft had been destroyed in the past ten months, and their MIG aircraft had been reduced by 50 percent. An estimated 500,000 people had been diverted to maintaining and repairing roads, railroads, and vital facilities. COMUSMACV stated Hanoi had little to show for its expenditure of effort and cost, in contrast to the political, economic, and military progress being made by the South Vietnamese government. 46/

The Senate Preparedness Investigating Subcommittee on Armed Forces, which held hearings on the air war against North Vietnam in August 1967, made the following comments on the effectiveness of ROLLING THUNDER: 47/

"...Thus, weighed against the situation which would have existed had the air campaign not been countered, it is clear that the air effort against North Vietnam has borne substantial fruits and has been as effective as might be expected considering the restrictions and inhibitions placed on our airpower by civilian authorities in Washington.

That greater results have not been achieved is attributable in our judgment, to these restrictions rather than to any lack of skill or ability of our aviation forces or of ingenuity, courage, and dedication of our soldiers, sailors, and airmen.

"We believe the air campaign has been crucial and vital in saving many American and allied lives in South Vietnam. We believe also that the enemy has been hurt in his homeland and, while he is thus hurt, the pressure should be increased and not reduced to persuade him that his continued support of the war in South Vietnam is definitely not in his best interests. The propaganda campaign from Hanoi, designed to stop the bombing, is strong evidence that the enemy is paying a price he does not wish to pay...."

A somewhat different assessment of ROLLING THUNDER effectiveness was made by the French delegation in Hanoi. Based on a comparison of U.S. and DRV statistics with eyewitness reports, the French delegation was inclined to believe that U.S. figures on its aircraft losses were too low and North Vietnam's figures came closer to the truth. The French concluded since air activity over North Vietnam had been stepped up in mid-April, U.S. aircraft losses had increased drastically, perhaps as much as five-fold. Despite direct U.S. hits on the North Vietnamese transportation network, they reported the Vietnamese had successfully found makeshift solutions, which permitted the transportation network to function after brief delays. The French believed "equilibrium" had been attained between U.S. destruction in the transportation field and Hanoi's ability to repair damages, and that this deadlock could be maintained for a long time. While the U.S. destroyed a significant number of rolling stock items, they were constantly being replaced by new equipment from Communist countries. The U.S. had been successful in destroying industrial centers, but destruction of North Vietnam's industry did not

significantly affect Hanoi's war effort. It merely forced Hanoi to depend on foreign aid for items formerly manufactured locally. The French delegation believed the North Vietnamese economy, with help from CHICOMs, could continue to feed the North Vietnamese population on a "subsistence level". 48/

CHAPTER VI

NORTH VIETNAM AIR DEFENSE SYSTEM

Assessment

In his End of Tour Report, the 7AF, DCS/Operations stated in July 1967 that:

> *"In the mid and late summer of 1966 the enemy had achieved air superiority in the skies of his heartland. The SAM's were forcing us into the vulnerable 4500 foot area, the MIG attacks were being pressed with determination, causing us to jettison ordnance en route to the target and his Air Defense Control System was completely integrated and functioning with precision. Without reservation the dramatic change in effectiveness of operations that the 7AF units have been able to achieve in the Red River Valley of North Vietnam is the most outstanding accomplishment of the past year's operation."*

DCS/Operations pointed out the introduction of CBU 24/29 in quantity, and use of electronic jamming for all fighters were responsible for degrading effectiveness of the enemy air force and SAM system. Only AAA in the immediate target areas remained as a major threat. In this more permissive environment, bombing accuracy had increased and fewer sorties per target were required to achieve the desired level of destruction. Loss rates had decreased sharply, from 18/1,000 to 8/1,000, and the figure of 3.5/1,000 in the last weeks of June was approaching Korean and in-country rates. 1/

MIGs

Air-to-air engagements over North Vietnam were sharply intensified during the first six months of 1967. There were 115 encounters and 161 engagements, which resulted in 47 MIG losses and 7 probables, as compared with 11 U.S. aircraft losses. This trend had become apparent during the last quarter of

1966, when Hanoi began using MIG aircraft as an active defense weapon on a continuing basis. Prior to that time, effectiveness of the MIGs, which first attacked U.S. aircraft in April 1965, had been limited. 2/

At the beginning of the year, CINCPAC advised JCS that enemy strategy had the objective of prolonging the war by keeping the U.S. out of the vital Hanoi/Haiphong region. There was a possibility that within a relatively short time, the growing enemy air defense system would make air operations in the Hanoi/Haiphong region too costly for the type of targets which could now be hit. Therefore, the U.S. had the choice of abandoning the air war over the Red River Delta, which provided the enemy with a sanctuary needed to prolong the war, as well as to accept losses without commensurate return; or to expand the target list, and attack the enemy's air defense system, including MIG air bases and aircraft on the ground. 3/

CINCPAC listed six basic actions to diminish the MIG threat: (1) destroy MIGs in the process of protecting U.S. or friendly forces; (2) employ TALOS in an offensive as well as defensive role; (3) entice MIG pilots to defect; (4) conduct MIG trap operations, such as the highly successful Operation BOLO; (5) attack primary command and control centers to degrade control and coordination procedures; and (6) attack MIG bases. CINCPAC preferred to strike the key MIG bases at Phuc Yen and Kep now, and Gia Lam/Cat Bi, if the enemy dispersed jet aircraft to these bases. 4/

Operation BOLO, on 2 January, was the most singularly successful operation of the air war to that date. The trap, carefully planned and executed by 7AF,

involved an F-4C force configured to look like an F-105 strike force, and flown in a similar mission profile. It resulted in seven MIG-21s downed within 12 minutes, with no U.S. losses. The aircraft loss represented nearly half of Hanoi's total force of MIG-21s; however, North Vietnam had the capability of assembling MIG-21s stored in crates at Phuc Yen. 5/

After the successful operations of January, there was considerable less activity in February. This was attributed to poor weather, as well as Hanoi's usual pattern of reducing air activity after experiencing heavy losses. They, very possibly, were revaluating tactics and increasing their training. 6/

MIG activity, which had increased slightly during March, was on a definite upswing during the latter part of April, when weather conditions improved. The new tempo was reflected in the loss of nine U.S. aircraft between 19-30 April--the first losses to MIG activity since December 1966. Tactics employed by the MIGs revealed the MIG-17 force was kept below 9,000 feet in flights of four in orbital patterns, and within 15 nautical miles of each base. The MIG-21 force was held back when confronted with a large U.S. strike force, and were later launched in pairs in post-strike pursuit. This tactic had saved MIG-21s at the expense of MIG-17s. Nine enemy aircraft were downed and additional aircraft were damaged by attacks on airfields. 7/

May was characterized by the highest number of aerial confrontations of the war. Engagements resulted in destruction of 26 enemy aircraft and the loss of two U.S. aircraft. The longest dogfight of the war took place on 20

May, when Air Force pilots destroyed four MIG-17s and two MIG-21s. Fifteen additional aircraft were destroyed on the ground. There was a marked decrease in MIG aggressiveness during the latter part of the month; while many MIGs were sighted, they avoided combat. 8/

Five more MIGs were shot down during 2-10 June, with no U.S. losses. After the heavy losses in May and June, the NVNAF lost even more of its fighting spirit. Photo coverage of air bases during the period showed that all MIGs were concentrated on Phuc Yen and Gia Lam. North Vietnam had only seven MIG-21s and 28 MIG-15/17s on their bases, which would indicate approximately 50 MIGs had been redeployed to their base sanctuary in southwest China. It was estimated the NVNAF would continue to avoid contact with U.S. forces, until they had pursued an intensive training course and felt ready to again confront U.S. aircraft. 9/

PACAF Intelligence stated: 10/

> *"The relatively few MIGs remaining in NVN still have the capability for hit and run attacks on US strike forces and particularly on US reconnaissance and support missions. It is also possible that up to 24 NVN MIGs could be brought back into NVN from China with little or no warning. The NVNAF has five operational jet capable air bases plus two more under construction and a large coolie force to repair damages. This permits a flexibility in strength and location for expanded future operations."*

Antiaircraft

Antiaircraft and Automatic Weapons continued to pose the greatest threat to friendly air operations. During the first six months of 1967, the U.S. suffered 151 aircraft losses over NVN, with the majority of them presumed lost

to AAA. Nearly 70 percent of the U.S. losses during January - May 1967, were due to ground fire hits received below 13,000 feet. The maximum effective range of the optically-sighted 57-mm was approximately 13,000 feet. Ground fire hits above 13,000 feet accounted for only 3.2 percent of the U.S. losses. The ground fire threat in this higher altitude included radar-controlled 57-mm, 85-mm, and 100-mm weapons. 11/

In January, the total number of gun positions was 28,826 with 7,126 of them occupied. By June, these figures had risen to 33,993, and 8,722. The largest increases occurred in RPs I and VI. The increased number of gun positions could accommodate a rapidly expanded gun inventory, if necessary, as well as provide greater weapons system flexibility. Total figures were not absolute and varied because of undetected movement and inadequate photo coverage. Greater emphasis on detecting and reporting AAA sites, also, may have accounted in part for the increase. 12/

Certain trends became apparent during this period. After trying medium AAA without great success, Hanoi began to place increasing reliance on light guns (37/57-mm). This decision probably was prompted by U.S. tactics to counter SAM effectiveness, which placed U.S. aircraft within range of light AA and automatic weapons. Growing U.S. ECM efforts and bombing profiles also undoubtedly influenced the change. By August 1966, light positions outnumbered mediums nearly two to one--10,000 plus compared to 5,500. By January 1967, the position ratio was nearly three-to-one and in June the ratio had continued to grow to 3.4 to 1. The light weapons continued to be effective, and it appeared they would pose the most serious challenge to

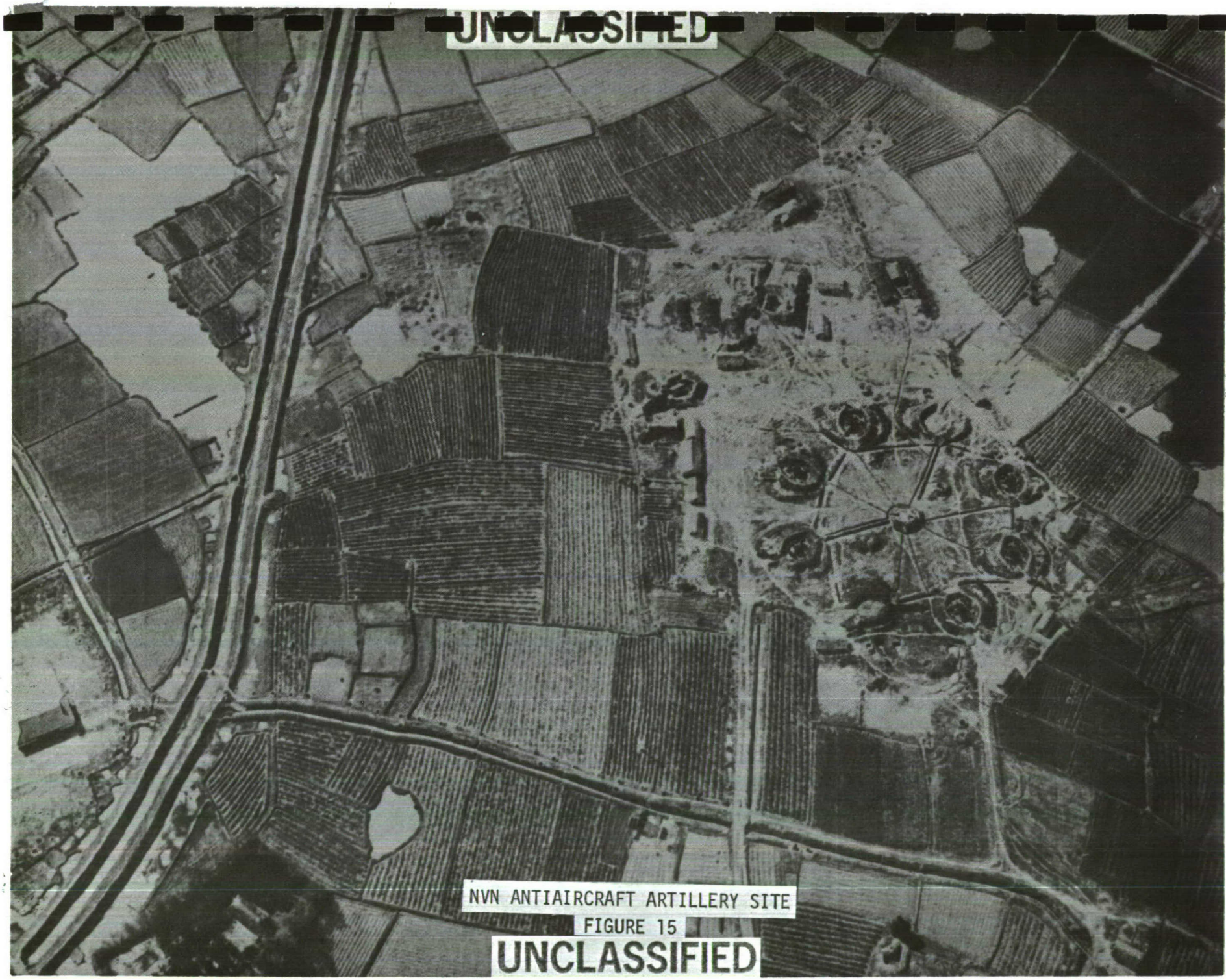
U.S. aircraft in the coming months.[13]

Surface-to-Air Missiles

At the beginning of the year, the surface-to-air missile Order of Battle (SAM OB) carried 160 active SAM firing sites in North Vietnam, 30-32 SAM battalions, with an operational readiness rate averaging 24 battalions at any one period. Fifteen new SA-2 sites were added to the SAM OB in June. From 1965, when the SA-3 missiles became operational, until the end of 1966, 46 aircraft (including unconfirmed losses) had been downed by this weapons system. Twenty-five aircraft were lost to missiles during the first six months of 1967.[14]

The 271 firings in January were the highest number reported to that date. There was a sharp decrease to 132 firings in February, and a slight increase to 160 in March. SAM firings set new records during April (375 - 400) and May (410), with five and eleven U.S. aircraft losses respectively. The missile firings per aircraft kill ratio for April were approximately 60:1 and 37.2:1 for May. By May, the total number of SAMs fired in 1967 already exceeded the total fired for 1965 and 1966 combined.[15]

An SA-2 missile site photographed on 28 April, fifteen kilometers north of the DMZ, contained four camouflaged missiles with associated radar. This complex was the farthest south that NVN missile launchers had been sighted. Twenty-one camouflaged AAA sites were south and one 57-mm AAA site was about 12 kilometers northwest of the missile site. The missile site and AAA positions were hit on 29 and 30 April by aircraft, naval gunfire, and 175-mm artillery.



NVN ANTIAIRCRAFT ARTILLERY SITE

FIGURE 15

The site was no longer considered operational.[16]

After 22 May, there was a noticeable decrease in all types of defensive reactions. The 205 SAM firings reported during June were approximately 50 percent of the number fired during May. This reduction could have been due to a partial depletion of missile stockpiles, or the fact that SAM crews were undergoing additional training to increase their skills.[17]

At midyear, the 7AF DCS/Operations made these comments concerning SAMs:[18]

> *"We are now in a position where we can systematically start to eliminate his known occupied fixed SAM sites if we desire. The area of most concern on this subject is in the immediate vicinity of Hanoi where he has the capability of simultaneously launching from several sites. Reducing the total sites in this area would be a distinct advantage and permission to enter the 10-mile circle is sorely needed to accomplish this task. There is a disadvantage to this tactic, however, we now know the location of most SAM sites and are able to visually acquire missiles when launchings are announced. If we press attacks he will be forced to stay on the move thus reducing our knowledge of precisely knowing where to concentrate our attention. A thinning out of the multi-covered areas so that penetration and withdrawal routes can be optimized is a definite requirement."*

CHAPTER VII

AIR FORCE ADVISORY GROUP

Mission

The USAF Advisory Group continued its role of assisting, training, and augmenting the South Vietnamese Air Force. This mission was accomplished through staff advisors at VNAF headquarters and seven advisory teams. USAF technicians and aircrews were assigned with these teams to fly training and operations missions and to give technical and administrative assistance to the South Vietnamese Air Force. 1/

With the rapid expansion of the VNAF almost completed, future goals were aimed at stabilization, modernization, and professionalization. The Advisory Group planned to achieve these objectives through increased stress on managerial procedures, establishment of effective command and control, improvement of the safety program, and further development of instrument and night flying capabilities. The modernization program would be achieved through introduction of improved aircraft, with a greater capability, not only in the fighters, but also in the helicopter and transport area. 2/

VNAF Resources

In June 1967, VNAF had an authorized personnel strength of 15,484 assigned versus 15,687 authorized. VNAF resources consisted of these squadrons: six fighter, four liaison, five helicopter, three transport, and one reconnaissance. They also had four tactical composite wings, basically supporting the four Corps Commands, one tactical/transport wing at Bien Hoa Air Base, and the air training center at Nha Trang. 3/

Modernization

The USAF had to accomplish extensive manning arrangements, as the VNAF received a squadron of F-5 aircraft on 17 April. Seven USAF officers and 31 airmen were provided in direct support of this program, as well as 69 USAF maintenance/support airmen obtained on a temporary duty basis to bolster the program in its initial stages. During this heavy-need period, 83 maintenance/support airmen were also requisitioned from CONUS resources to arrive in staggered increments through August 1967, with each serving approximately 90 days. As VNAF strength rose, USAF support was programmed to diminish proportionately.[4/]

During June, the VNAF 522d Squadron completed its first month in a fully operationally ready status, and F-5 pilots flew 388 sorties: 303 were operational, 51 were for training, and 34 were listed as "other". During the month, 443 hours were flown, providing a utilization rate of 22.6 hours per possessed aircraft. The VNAF F-5 pilots were programmed for a concentrated instrument training program to attain and maintain a high degree of instrument proficiency. This program was scheduled for completion in September 1967.[5/]

A heat-fogging problem in the F-5 (C model) aircraft was brought to the attention of the VNAF Surgeon during June. Apparently due to high humidity in South Vietnam, the water separator in the C model aircraft was either inadequate, or in need of repair or replacement. Unless the heat was increased to a level that was most uncomfortable for the pilot, the canopy fogged up in the GCA pattern, on takeoff, and when diving below 4,000 feet for a

bomb run. At times, water was sprayed back on the pilot. USAF pilots had also experienced the same difficulty but had accepted the discomfort. The VNAF surgeon believed Vietnamese pilots could not withstand the loss of salt as well as U.S. pilots. They drank less water, had a low protein diet, and therefore became very fatigued upon completion of a mission. Since the water separator in the D model was more powerful and performing adequately, there was a possibility it could be adapted to the C model. It was recommended that Operations report the deficiency through proper channels. 6/

Additional fighter modernization included conversion of three A-1 squadrons to A-37 jet aircraft during FY 1969. One squadron would convert each quarter, starting in FY 2/69. One C-47 squadron converted to C-119G transports in FY 3/68, and one C-47 squadron would convert to an AC-47 gunship configuration in FY 68. One H-34 helicopter squadron would convert to the UH-1D helicopter in FY 69. 7/

At the beginning of the year, the shortage of UE-34s was a major problem. However, the shortage was being resolved by late March, with the arrival in-country of six helicopters, and the scheduled delivery of an additional six helicopters on 7 April 1967. Four other helicopters had completed overhaul and were awaiting booking dates. Follow-on deliveries at a minimum rate of six per month should bring VNAF to authorized strength by 1 September 1967. 8/

A total of 39 UH-34Gs had been approved by the Secretary of Defense for transfer from Navy sources for VNAF use. Twenty-eight helicopters had arrived in-country by June. The remaining 11 helicopters were scheduled to

arrive during July. 9/

By midyear, the VNAF had flown 17,258 strike and 62,573 nonstrike sorties. Of the total strike sorties, 728 were close air support, 1,626 escort, and 14,904 interdiction. During this period, the VNAF experienced 33 aircraft losses and 71 damaged. 10/

In an assessment of the Vietnamese Air Force in April, COMUSMACV stated that "during the past year the VNAF's combat capability and effectiveness have gradually but consistently and continuously improved." One of the most significant achievements of the VNAF had been its "sustained and effective support of the ARVN in accomplishing its mission in all four Corps areas, especially the IV Corps area," which was an indication of its growing maturity and stabilization. VNAF accident rates continued to be high compared to USAF standards, but in view of the increase in hours and sorties flown in CY 66, the accident rate showed a healthy downward trend. Although some deficient areas remained, the overall personnel posture had improved and construction projects were progressing satisfactorily. 11/

FOOTNOTES

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3. (S) Ibid.
4. (TS) Msg, CINCPAC to JCS, 14 Jan 67.
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6. Ibid.
7. Ibid.
8. Ibid.
9. (S) Msg, CINCPAC to JCS, 25 Jan 67.
10. Ibid.
11. Ibid.
12. Ibid.
13. Ibid.
14. Ibid.
15. (S) Msg, COMUSMACV to Comdr, 7AF, COMNAVFORV, 2 May 67.
16. Ibid.
17. (U) Speech by COMUSMACV, 24 Apr 67.
18. Ibid.
19. (C) Msg, COMUSMACV to CG, III MAF, CG, IFFV, etc., 11 Oct 67.
20. Ibid.
21. Ibid.
22. Ibid.

CHAPTER II

1. (S) Briefing Hq 7AF, Senate Armed Services Preparedness Investigating Subcommittee, 29 Oct 67. (Hereafter cited: Briefing, Senate ASPIS.)

2. Ibid.

3. (S) Rpt, Hq 7AF, Command Status - Jan 67, Jun 67.

4. (TS) Rpt, USAF Historical Div, USAF Deployment Planning for SEA-1966, Jun 67; Msg, CINCPACAF to 7AF, 170331Z Nov 66.

5. (TS) Msg, CINCPACAF to 7AF, 170331Z Nov 66.

6. (S) Msg, COMUSMACV to CINCPAC, 28 Mar 67.

7. (S) Msg, COMUSMACV to CINCPAC, 289145Z Mar 67.

8. (S) Ibid.

9. (S) Ibid.

10. (S) Msg, COMUSMACV to Component Commanders, 15 Jul 67.

11. (S) History Rpt, 37TFW, Apr - Jun 67; Briefing, Senate ASPIS.

12. (S) Briefing, Senate ASPIS.

13. (S) Msg, CINCPACAF to 5AF, 9 Mar 67; Msg, CINCPACAF to CINCPAC, 112030Z May 67.

14. Ibid.

15. Ibid.

16. (S) Directive, Hq 7AF, Program Action Nr 67-18, 19 Apr 67; Msg, CINCPACAF to 7AF, 11 Mar 67.

17. (S) Msg, Dep Comdr, 7/13AF, Udorn, Thailand to 7AF, 28 May 67; Msg, Hq 13AF to CINCPACAF, 29 May 67.

18. (TS) Msg, CINCPAC to CINCPACAF, 3 May 67; Msg, CINCPACAF to CSAF, 28 Apr 67.

19. (TS) Msg, CSAF to SAC, TAC etc., 29 May 67.

CHAPTER III

1. (U) Press Release, MACV, 16 Apr 67.
2. (S) MONEVAL, MACV, Jan 67;
   (TS) Summary of Air Opns, PACAF, Jan 67.
3. (S) MONEVAL, MACV, Feb 67.
4. (S) MONEVAL, MACV, Mar 67;
   (TS) Summary of Air Opns, PACAF, Mar 67.
5. (S) MONEVAL, MACV, Apr, May 67.
6. (S) MONEVAL, MACV, Jun 67; Rpt, Effects of Air Operations, PACAF, Jun 67.
7. (C) Special Study, CHECO,"Operation PAUL REVERE/SAM HOUSTON," 27 Jul 67.
8. Ibid.
9. Ibid.
10. (S) Special Study, CHECO, "Operation THAYER/IRVING," 12 May 67.
11. (TS) Summary of Air Operations, PACAF, Mar 67;
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15. (C) Special Study, CHECO, "Operation ENTERPRISE," 20 May 67.
16. (TS) Special Study, CHECO,"Operation HICKORY," 24 Jul 67.
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GLOSSARY

AA/AW	Antiaircraft/Automatic Weapons
AAA	Antiaircraft Artillery
ABERU	Airborne Emergency Reaction Units
ALCC	Airlift Command Center
ALO	Air Liaison Officer
AMC	Airborne Mission Commander
AMEMB	American Embassy
AOB	Air Order of Battle
ARDF	Airborne Radio Direction Finding
ARRG	Aerospace Rescue and Recovery Group
ARVN	Army, Republic of Vietnam
BC	Body Count
CARA	Combat Aircrew Recovery Aircraft
CAS	Close Air Support
CBU	Cluster Bomb Unit
CHICOM	Chinese Communist
CINCPAC	Commander in Chief, Pacific
CINCPACAF	Commander in Chief, Pacific Air Forces
CINCPACFLT	Commander in Chief, Pacific Fleet
CINCSAC	Commander in Chief, Strategic Air Command
COSVN	Central Office, South Vietnam
CSAF	Chief of Staff, Air Force
CTF	Corps Task Force
CTZ	Corps Task Zone
DEPCOMUSMACV	Deputy Commander, U.S. Military Assistance Command, Vietnam
DMZ	Demilitarized Zone
ECM	Electronic Countermeasure
EEI	Essential Elements of Information
ELINT	Electronic Intelligence
FWMAF	Free World Military Assistance Forces
GCA	Ground Controlled Approach
GVN	Government of Vietnam
HF	High Frequency
ICC	International Control Commission
JCS	Joint Chiefs of Staff
JRC	Joint Reconnaissance Center
JSARC	Joint Search and Rescue Center

KBA	Killed by Air
KIA	Killed in Action
LOC	Line of Communication
MACV	Military Assistance Command, Vietnam
MAF	Marine Amphibious Force
MIBARS	Military Intelligence Battalion Aerial Reconnaissance Survey
MM	Millimeter
MSR	Main Supply Route
MT	Megaton
NM	Nautical Mile
NVN	North Vietnam
OB	Order of Battle
PACAF	Pacific Air Forces
POL	Petroleum, Oil and Lubricant
POW	Prisoner of War
PSYWAR	Psychological Warfare
RAD	Requirements Action Directive
R&D	Research and Development
RP	Route Package
RSSZ	Rung Sat Special Zone
RT	ROLLING THUNDER
RVNAF	Republic of Vietnam Air Force
SAM	Surface-to-Air Missile
SAR	Search and Rescue
SEA	Southeast Asia
SLAR	Side-Looking Airborne Radar
SSB	Single Side Band
SVN	South Vietnam
TAC	Tactical Air Command
TACC	Tactical Air Control Center
TACP	Tactical Air Control Party
TASE	Tactical Air Support Element
TFS	Tactical Fighter Squadron
TFW	Tactical Fighter Wing
TPP	Thermal Power Plant
TRS	Tactical Reconnaissance Squadron
UHF	Ultra High Frequency

VC	Viet Cong
VHF	Very High Frequency
VNAF	South Vietnam Air Force
WIA	Wounded in Action
WW	Wild Weasel