

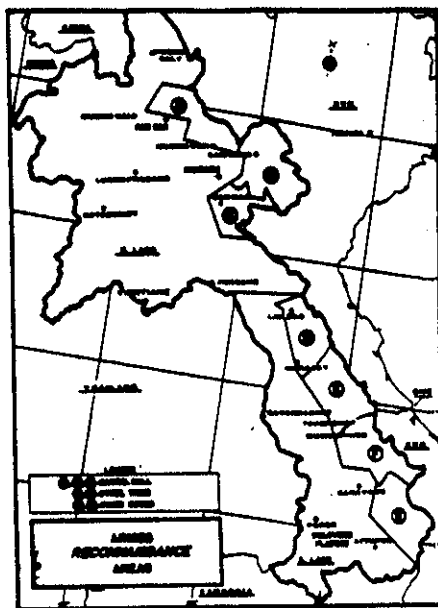
PROJECT
Contemporary
Historical
Examination of
Current
Operations
REPORT

USAF OPERATIONS from THAILAND

1 JANUARY 1967 TO 1 JULY 1968

HQ PACAF
Directorate Tactical Evaluation
CHECO DIVISION

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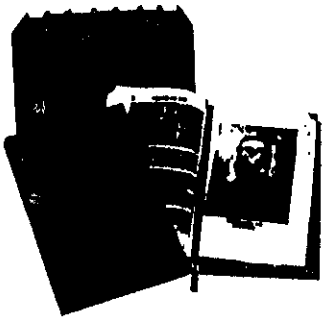


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TABLE OF CONTENTS

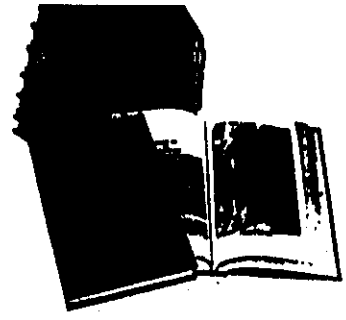
	<u>Page</u>
FOREWORD	vi
INTRODUCTION	vii
Flexibility and Centralized Control	vii
Laos and Neutrality	viii
Dual Character of War	ix
CHAPTER I - U.S. AIRPOWER	1
Command and Control	1
Ambassador to Laos	3
Targeting and Concepts of Operation	5
Fragging, Control, and Diversions	7
ABCCC	8
Forward Air Controllers	11
CHAPTER II - THE WAR FOR LAOS	12
Politics	12
American Air Attache	13
RLAF	15
The Ground War	18
Dry Season, 1967--Enemy Stalled	21
Wet Season 1967, Friendly Vacillation and Dissention	24
Dry Season, 1967-68--Initiative Lost	28
North Laos	30
Site 85	30
Through June 1968 in the North	31
Site 36	33
South Laos	34
CHAPTER III - ENEMY LOCs and RULES OF ENGAGEMENT	37
Enemy LOCs and Tactics	37
History of Ho Chi Minh Trail	38
Operation of the Ho Chi Minh Trail	39
Defenses along the Trail	43
Rules of Engagement	45
Short Rounds	48
Muong Phalang and Site 61	49
Revised Rules of Engagement	51
Easing of Short Rounds--Channel 77	52
Changes of ROE in BARREL ROLL	55

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	<u>Page</u>
CHAPTER IV - CONDUCT OF USAF OPERATIONS AND DEVELOPMENTS	58
Trends in Operations	59
Developments	65
Target Acquisition	67
CHAPTER V - AIRPOWER RATIONALE AND RECOMMENDATIONS	78
Props vs Jets	78
Ambassador's Needs and 7AF Responses	82
TFA, Command and Control Element	90
CHAPTER VI - SUMMARY OF OPERATIONS	94
Dual Character of War	94
U.S. Ambassador-Commander, 7AF, Relationship	94
USAF-RLAF Performance	95
Improving the Air Effort	95
Advantages of the Enemy	96
FOOTNOTES	
Introduction	98
Chapter I	98
Chapter II	101
Chapter III	106
Chapter IV	110
Chapter V	113
APPENDIXES	
I - USAF Strikes in Laos, 1 Jan 67-30 Jun 68	115
II - Results of USAF Attacks	122
GLOSSARY	129
FIGURES	<u>Follows Page</u>
1. Armed Reconnaissance Areas	2
2. General Orbit Positions	8
3. Enemy Attack Areas	20
4. Situation in Laos	34
5. Ho Chi Minh Trail	38
6. USAF Sorties Which Drew Enemy Fire	44
7. USAF Aircraft Combat Losses in Laos	44
8. Zoned Armed Recon Areas	52
9. USAF Strike Sorties in Laos	58
10. B-52 Sorties in Laos	58

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FOREWORD

Combat air operations in "USAF Operations from Thailand, 1 January 1967 - 1 July 1968" are discussed against a background of developments in the Laotian ground war. Because this report places the Laotian conflict within the context of the entire Southeast Asian struggle, the problems of command and control are major points which are examined. Other topics trace developments in enemy lines of communication, Rules of Engagement, and trends and developments in the application of airpower.

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INTRODUCTION

Flexibility and Centralized Control

Of primary concern in this study are combat air operations over Laos-- part of the immense effort that the U.S. Air Force carried out in Southeast Asia. Many of the same forces that waged the air campaigns in Laos were utilized in South Vietnam, as well as against North Vietnam. These forces were not unlimited; nor were they unhampered in application by restraints and restrictions--military and political.

Assignations of Air Force airpower, under operational control of the Commander, 7th Air Force, were made with a view of the totality of the Southeast Asian conflict in all its facets and demands. In this way, it was believed, the fullest capability of all airpower could be realized. This concept permitted the shifting of emphasis for various periods to one phase or another of the total air war. For example, during the Northeast Monsoon season, when enemy supply routes in Laos dried and were being heavily utilized, considerable emphasis could be directed to interdiction missions.

Similarly, flexibility and centralized control allowed the Air Force to better cope with daily problems. Aircraft could be diverted from targets hampered by bad weather to other areas. Strikes could be shifted to more lucrative targets. In addition, surprise enemy moves in rapidly changing tactical situations could be better countered.

Nevertheless, although it was viewed that overall needs could best be met by these concepts, not all the desires for airpower in Laos held priorities

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sufficiently high to be rapidly fulfilled.

Laos and Neutrality

Laos, a nation of 2,700,000 people living in an area of less than 92,000 square miles, bordered Communist China, Burma, North Vietnam (NVN), South Vietnam (SVN), Cambodia, and Thailand. Located in the middle of the South-east Asian arena of conflict, the Royal Laotian Government (RLG) had great difficulty in maintaining its existence.

In 1962, supported by the Geneva Accords which guaranteed its "neutrality", a coalition government of contending pro-Communist, Neutralist, and pro-Western factions was formed. Ruled nominally from the Royal Capital at Luang Prabang by King Savang Vatthana, the administrative capital was located at Vientiane. The chief of state and premier was Souvanna Phouma, who maintained the support of the National Assembly.

However, the formation of a neutral coalition government did not end the conflict in Laos. By 1963, the pro-Communist military forces, the Pathet Lao (PL), once again assisted by North Vietnam, resumed the struggle. In May 1964, when the PL attacked Neutralist forces in the Plaine des Jarres, the Government of the United States demonstrated American support for the legal Laotian Government. In response to a Laotian request, the U.S. Air Force and Navy began a limited reconnaissance program (YANKEE TEAM) to help identify PL locations and prove North Vietnamese participation. Since 1964, the American air effort expanded considerably from the strict reconnaissance role. The U.S. Air Force alone, flew more than 57,000 combat and combat support sorties in 1966. In

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1967, the number rose above 76,000. In only the first half of 1968, nearly 53,000 sorties were flown.^{1/}

Since 1964, the continued aggression by the PL and North Vietnamese has made the neutral stand of the Laotian Government more difficult to maintain. For survival, the RLG has been forced to lean toward the American side in the Southeast Asian struggle. During an October 1967 visit by Premier Souvanna Phouma to Paris, this tendency was criticized by French President Charles de Gaulle. An American Attache report from Vientiane related Souvanna's response:^{2/}

"...Souvanna stated rather sharply that it is the intention of Laos to be neutral, but with 15 or 20 Laotians being killed each day by the North Vietnamese, Laos had adopted a policy which might appear to de Gaulle to be anti-NVN. Souvanna further added that Laos is therefore as neutral as it is permitted to be."

Dual Character of War

As the war in South Vietnam expanded, enemy supply lines through Communist-controlled portions of Laos increased in scope and importance. As a result, Laos became more significant. While refraining from committing ground forces to Laos, the U.S. recognized that the Laotian Government had to be maintained. Souvanna Phouma provided the best and most stable leadership for the many factions in the nation. In addition, if American airpower was to continue to enjoy the permission to strike enemy supply lines in Laos, as they stretched to South Vietnam, support of Souvanna, his Government, and Laotian military forces was necessary.

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Hence, there were, in essence, two air campaigns being waged in Laos. One was directed against the North Vietnamese supply lines to SVN; the other had the objective of supporting the Laotian Government against the encroachments of PL and North Vietnamese Army (NVA) forces.

It was necessary to have in mind the dual character of the war in Laos, in order to better grasp the problems. The duality, however, did not mean exclusion, one from the other. The two wars were unique and yet intertwined. One connecting link was the U.S. Ambassador to Laos. He, perhaps, more than any other American official, was concerned with both wars. The Air Force was responsible for fulfilling his requirements within the context of the priority demands on airpower.

Therefore, it was necessary to have, at the minimum, a general view of the war inside Laos from January 1967 through June 1968, so as to gain some perspective in understanding the basis for the requirements which the Ambassador levied against the 7AF Commander, as well as the responses generated in return.

In essence, this time span was not a productive one for the Laotian Government. Its military position was reasonably good in January 1967 and remained so until the late fall of that year. Subsequently, it eroded considerably, and the pressures which were generated by this deterioration were transferred from the Laotian military to the RLG, from the RLG to the U.S. Ambassador, and finally from him to the 7AF Commander.

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CHAPTER I
U.S. AIRPOWER

Command and Control

The Pathet Lao insurgency effort in Laos continued to receive aid from NVN in the form of men and supplies. In addition, the enemy used Laos as the major supply route to move men and supplies into SVN. To move against this two-pronged effort, the Commander-in-Chief Pacific (CINCPAC) had directed the Commander, United States Military Assistance Command-Vietnam (COMUSMACV), and the Commander-in-Chief Pacific Fleet (CINCPACFLT), to strike validated Royal Laotian Air Force (RLAF) targets and conduct armed reconnaissance in authorized areas to interdict enemy supply lines to SVN and Laos.^{1/}

Already, by April 1965, two armed reconnaissance areas had been established in Laos, BARREL ROLL (BR) in northern Laos and STEEL TIGER (SL) in the south.^{2/} To speed up the validation of targets, the southern portion of STEEL TIGER was designated TIGER HOUND in December 1965.^{3/} Later, BARREL ROLL was divided into three sectors, A, B, and C. Similarly, the south was divided: D and E formed STEEL TIGER, F and G sectors made up TIGER HOUND. (See Fig. 1.)

COMUSMACV had responsibility for the U.S. air campaign over Laos and the passes from NVN into Laos, as well as the adjacent Route Package I (RPI), the southernmost area of NVN.^{4/} These were in addition to COMUSMACV's primary obligation of South Vietnam.

The COMUSMACV objectives in Laos were:^{5/}

"Apply military pressure to achieve maximum effectiveness

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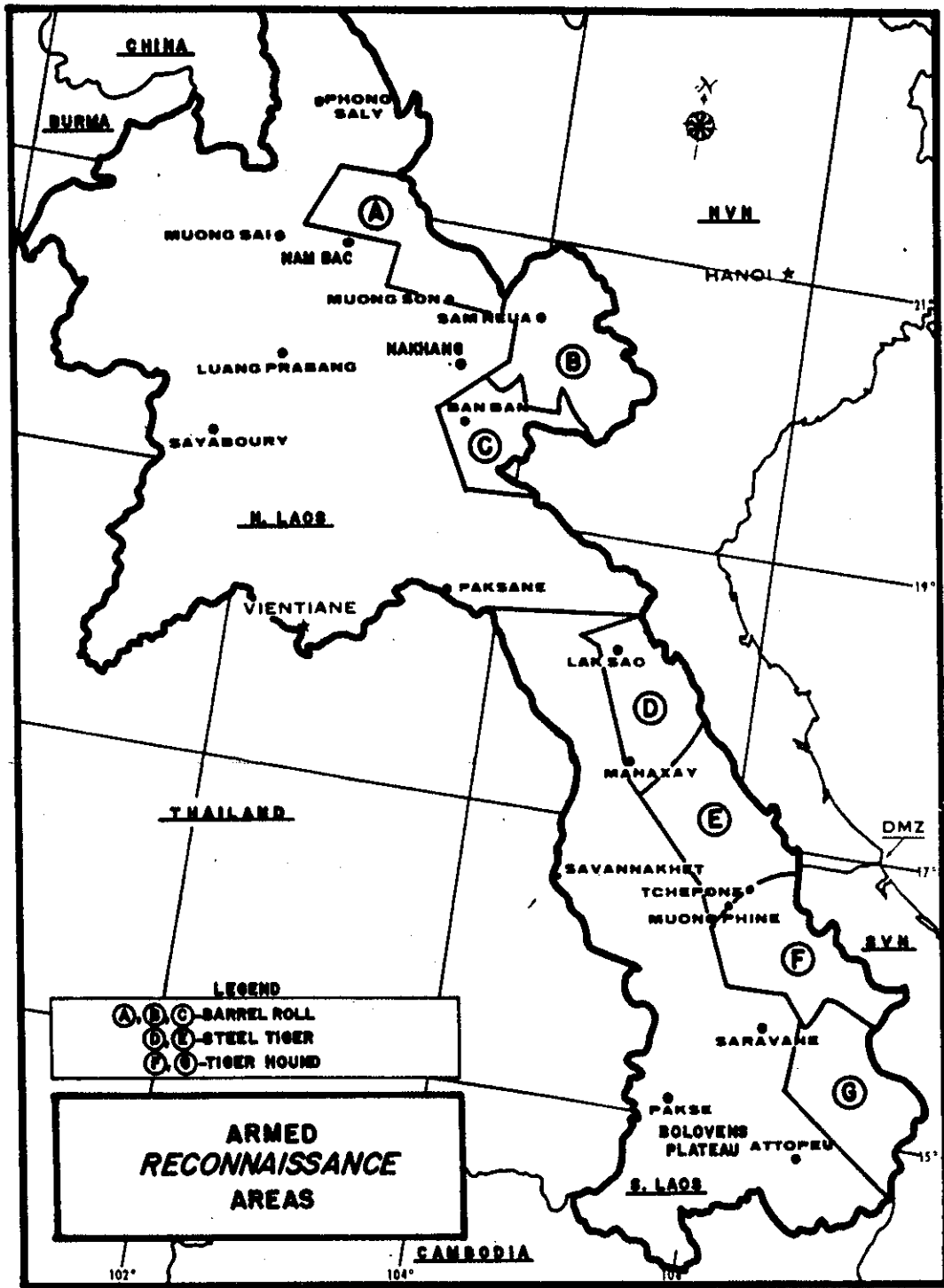


FIGURE 1

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in disrupting Pathet Lao and NVN logistical support; to disrupt enemy logistic flow into SVN; and to cause NVN to cease supporting the insurgencies in SEA."

To accomplish these tasks, COMUSMACV relied primarily on the resources of 7AF, headquartered at Tan Son Nhut AB, RVN. Additional sorties were provided by the 1st Marine Air Wing at Da Nang AB, RVN, and the Commander, Seventh Fleet. Furthermore, CINCPAC guaranteed COMUSMACV a minimum of 2,500 USAF strike sorties from Thailand-based units. These Thai-based sorties could be utilized in either Laos or RP I, according to COMUSMACV's needs.^{6/}

In turn, COMUSMACV delegated to the Commander, 7AF, the operations planning, scheduling, coordination, and execution of these tasks. As Air Component Commander for COMUSMACV, the Commander, 7AF, was appointed coordinating authority for U.S. operations within this area of responsibility. Direct liaison was authorized with appropriate American Embassies on matters pertaining to operational aspects in Laos, Thailand, and NVN.^{7/} Outside the responsibilities derived from COMUSMACV, the Commander, 7AF, also maintained operational control of all USAF strike forces in Thailand. This was derived from the Commander-in-Chief, Pacific Air Forces (CINCPACAF).^{8/}

Although U.S. Navy and Marine sorties were not under the operational control of the Commander, 7AF, for smoother operations, these military services were required to coordinate with 7AF on their intended strikes in Laos at least 48 hours before execution.^{9/}

In the role of Air Component Commander under COMUSMACV, the 7AF Commander

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example of this flexibility. When the Special Forces Camp at Kham Duc in SVN was attacked in May 1968, Hillsboro was shifted from its normal orbit to provide on-the-spot ABCCC service to the operation. Hillsboro played a significant part in managing the air resources which permitted evacuation of the defenders.^{39/}

Forward Air Controllers

To provide information and direction to attack aircraft, FACs were supplied from several sources:

- Ground FACs were associated with the Laotian Army (Forces Armees Royales, the FAR).
- Laos-based U.S. FACs operated under the auspices of the RLAF.
- Other FACs in BARREL ROLL and STEEL TIGER came from SVN or Thailand units. ^{40/}

FACs had to be familiar with the area they controlled, as well as the local enemy defenses and weather patterns. A full knowledge of the capabilities and munitions of strike aircraft, FAC procedures, and the serious consequences of misidentifying targets were vital to this phase of the operations.^{41/}

Aircraft that could be used in the FAC role were the O-1, O-2, T-28, A-26, A-1E, A-37, F-100F, and, when performing as flareships, the C-130A and C-123. Pilots of T-28 or A-1E aircraft flying in pairs were permitted to FAC for each other; however, when these were flown singly, pilots were not allowed to FAC for themselves, unless two qualified crewmembers were on board to cross check and positively identify the target. The A-26, normally carrying two qualified crewmembers, had the capability for FACing its own strikes.^{42/}

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CHAPTER II

THE WAR FOR LAOS

Politics

Elections held on 1 January 1967 gave Premier Souvanna Phouma's "United Front" about two-thirds of the seats in the National Assembly. The election had shown that Souvanna was better off politically than he had ever been before. Rightists had lost some strength, and neutralism, per se, had been so weak that no one had run under that label, although a few Neutralists had been elected. It was significant that the Forces Armee Royale (FAR) supported the "United Front", because the FAR was a very important factor behind the scenes.^{1/}

One PACAF publication analyzed:^{2/}

"In retrospect, the election campaign gave every appearance of the democratic tradition although there is little doubt that the rural vote was thoroughly manipulated by FAR Regional Commanders. The electorate, though largely illiterate, were not overtly crowded into voting for candidates that they did not personally approve or esteem. All in all, the democratic electoral process in Laos apparently succeeded as well as could be expected, thereby setting an example for the rest of SE Asia."

This degree of stability was to continue through 30 June 1968, but not without periodic fluctuations. Factionalism seemed endemic to Laos. Even fears of secession by certain portions of the nation occasionally cropped up. A deteriorating military situation in 1968 and grumblings in the FAR caused some anxiety, but no strike on the order of Neutralist General Kong Le's coup

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attempt of September 1966 or Air Force General Ma's try in October of the same year took place. Ma stayed out of reach in political asylum in Thailand. Kong Le threatened to return as he bounced from Indonesia to Hong Kong and finally came to rest, to the chagrin of the Laotian Government, in Paris.^{3/}

American Air Attache

A vital link in the air operations in Laos was provided by the Office of the American Air Attache (AAIRA) in Vientiane.

By the Geneva Accords of 1962, the signatories agreed that no foreign advisors, other than the French, would be allowed in Laos. In line with this, the U.S. Military Assistance Group (MAG) left Laos and moved to Thailand, although supply and some advice continued to be given. The AIRA and the Army Attache (ARMA) assumed these tasks (the ARMA operated with a smaller staff than the AIRA, and their "extra-curricular" activities were primarily observation and reporting).^{4/}

To handle the air portion of MAAG duties (among them the RLAF), coordinate Air Force combat activities with 7AF and the Deputy Commander, 7/13AF, advise the Ambassador on air matters, and perform the normal attache, intelligence, and administrative functions, the AIRA functioned with a strength of only 100 personnel.^{5/} This number was miniscule when compared to the nearly 50,000 NVA troops who were in Laos, and whose presence the North Vietnamese Government denied.

The 100-man limitation on the AIRA office posed many problems. In some cases personnel assigned were faced with operational difficulties and were

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called upon to give counsel on fast-changing and technical operational matters not normally associated with attache work, and hence, outside of their normal experience. This was an important function, since the Ambassador relied upon advice from this source in formulating his overall view of the air war, for which he was ultimately responsible.^{6/}

Normal attache functions, among them administration, had to be performed by a part of this group--and these duties were not minor. For example, more than 10,000 messages were processed by AIRA monthly.^{7/} The maintenance of records was a formidable task.

To fill the advisory role to the RLAF, the AIRA operated three AOCs. One each was located at Vientiane, Luang Prabang, and Savannakhet. A fourth was to be established at Pakse later in 1968. While lending assistance and advice to the RLAF, the AIRA was prohibited from actually taking part in combat operations, with the exception of providing FACs. The AOC at Luang Prabang is used as an example of the USAF manning at an AOC in Laos:^{8/}

- 1 AOC Commander (a T-28 Instructor Pilot)
- 1 FAC
- 1 Medic
- 1 Radio Operator/Repairman
- 1 Aircraft General Maintenance Specialist
- 1 Armament Specialist
- 1 Engine Specialist
- 1 Ordnance Specialist

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not steady because weekly sortie totals fluctuated considerably. Jumps from about 60 sorties per week to more than 200, and then back to 60 were not uncommon; therefore, no trend in operations can be discerned. These fluctuations were generally due to a variety of problems. Among them were maintenance problems, demand, losses, and, most of all, bad weather. ^{18/}

Bad weather was a continual hindrance to air operations over Laos. USAF strike sorties were inhibited greatly, but the Laotian T-28s, with generally lower performance and lacking the flexibility to switch to other areas for better operations, were severely hampered.

It may be roughly stated that two-thirds of the RLAF operations came from Vientiane and Luang Prabang. Luang Prabang was located in a small valley surrounded by mountains which rose to more than 5,000 feet. Aircraft flying north or northeast from Vientiane had to cross similar terrain; in one direction a mountain towered 9,000 feet. Monsoons, mountain weather, a shortage of navigational facilities and equipment, and low performance aircraft were not conducive to steady performance. In addition, worse conditions often existed in target areas.

The RLAF was completely subservient to the Forces Armees Royales (FAR). It was not represented in any of the higher echelons of command. ^{19/} This was one of the bones of contention in General Ma's coup attempt in late 1966 (another was the use of RLAF aircraft for personal gain by some officials). ^{20/} Hence, the primary mission of the RLAF strike capability was close air support.

The RLAF close air support was very unsophisticated. Communications,

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air-to-ground, were usually poor if they existed at all. Subject to the orders of FAR commanders, airborne diversions were seldom possible. A handful of AIRA FACs was all that was available to direct strikes.^{21/} Furthermore, instructions to FACs on targets were generally vague (some FAR ground commanders distrusted the idea of airstrikes and never called for them).^{22/} One AIRA FAC related that it was not rare to have a two-three-mile square pointed out on a map as the target area. It was the apparent expectation that the RLAF could level such an area. The FAC had to reconnoiter the general area to find a target before calling in the strikes, providing, of course, that the T-28s had not arrived before the FAC and already expended.^{23/}

Nevertheless, the RLAF T-28s played a considerable role in the total Laotian picture. Numerous FAR engagements may well have ended in defeat without their participation. The long, though eventually unsuccessful, defense of Nam Bac, described later in this study, would have been impossible without the RLAF. Royal Laotian Air Force operations were usually conducted in areas where USAF aircraft did not operate, and they were bound by much less stringent restrictions. The RLAF was also able to operate in the border areas of Laos, and strike targets which would have been impossible for the USAF under existing Rules of Engagement.^{24/}

Ground War

As 1967 opened, military prospects in Laos looked better for the RLAF. The previous August, friendly forces had succeeded in capturing and occupying the Nam Bac Valley in Luang Prabang Province. The valley, an area with high rice yields and good fruit production, had come under government control for the first

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time since 1960.^{25/} This region, just some 60 miles north of the Royal Capital at Luang Prabang, had historically provided the avenue of invasion from the direction of Dien Bien Phu in NVN.

Moreover, the ability of the RLG to take and hold Nam Bac was indicative of the receding Communist tide in northern Laos, where most of the population was located. Since 1964, when the battle had been resumed, Communist forces had been stubbornly and fitfully giving ground. There appeared little doubt that the PL was a spent force and would have "withered on the vine" if left to themselves.^{26/} But they were propped by the infusion of nearly 14,000 first line NVA combat troops organized in formal units. This number beefed the enemy tactical forces to about 50,000 PL, NVA, and dissident Neutralists. It was estimated that another 25,000 NVA were in Laos, but they served as advisors, engineers, and transportation and communications personnel, more directly associated with the infiltration and supply routes than direct combat. These numbers did not take into account combat units moving south to the Vietnamese war.^{27/}

Hence, although the friendly posture had been improving steadily, they were not in a position to make large scale military gains against the enemy as long as NVA units supported the PL.^{28/}

The war exhibited ebb and flow characteristics. Almost traditionally, during the dry season from November to April, the enemy moved to the offensive and expanded his holdings. Pushing back the friendly forces, he tried to consolidate newly won regions. But, as the wet season came on, from May to September, the communists were forced to pull back.

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By contrast, as enemy operations literally bogged down in most areas during the wet season, friendly forces became more aggressive. Numbering about 80,000 Royal Army, Neutralists, guerrillas (the Auto-Defense-de-Choc forces of Gen. Vang Pao), and paramilitary units (nearly half the total), friendly forces varied in combat effectiveness.^{29/}

In the past, the Neutral Army Forces (FAN) had been the best led and equipped units, but they lacked experience and training in large scale operations. Furthermore, they were reluctant to place themselves under the command or at the disposal of FAR officers, whom they distrusted.^{30/}

The most effective combat troops were the guerrillas, primarily the Mao tribesmen, who fought less for national ideals than their own way of life, institutions, and leaders. They naturally opposed the NVA as "outsiders". However, the guerrillas, the ADC, were not reliable beyond their indigenous locale and would fight only for certain leaders. The guerrillas were, in effect, mercenaries, fighting for U.S. supplied money, loot, and plunder. Such a force did not serve well in static positions.^{31/}

The paramilitary forces were home guards, and were mainly interested in their own villages, valleys, and provinces. Generally, effective only in scouting, guerrilla, or village defense roles, their training was weak, logistical support irregular, and they had little experience with crew-served weapons.^{32/}

The sole advantage held by friendly forces was airpower. Air supply and mobility considerably enhanced their capabilities. This was provided by the

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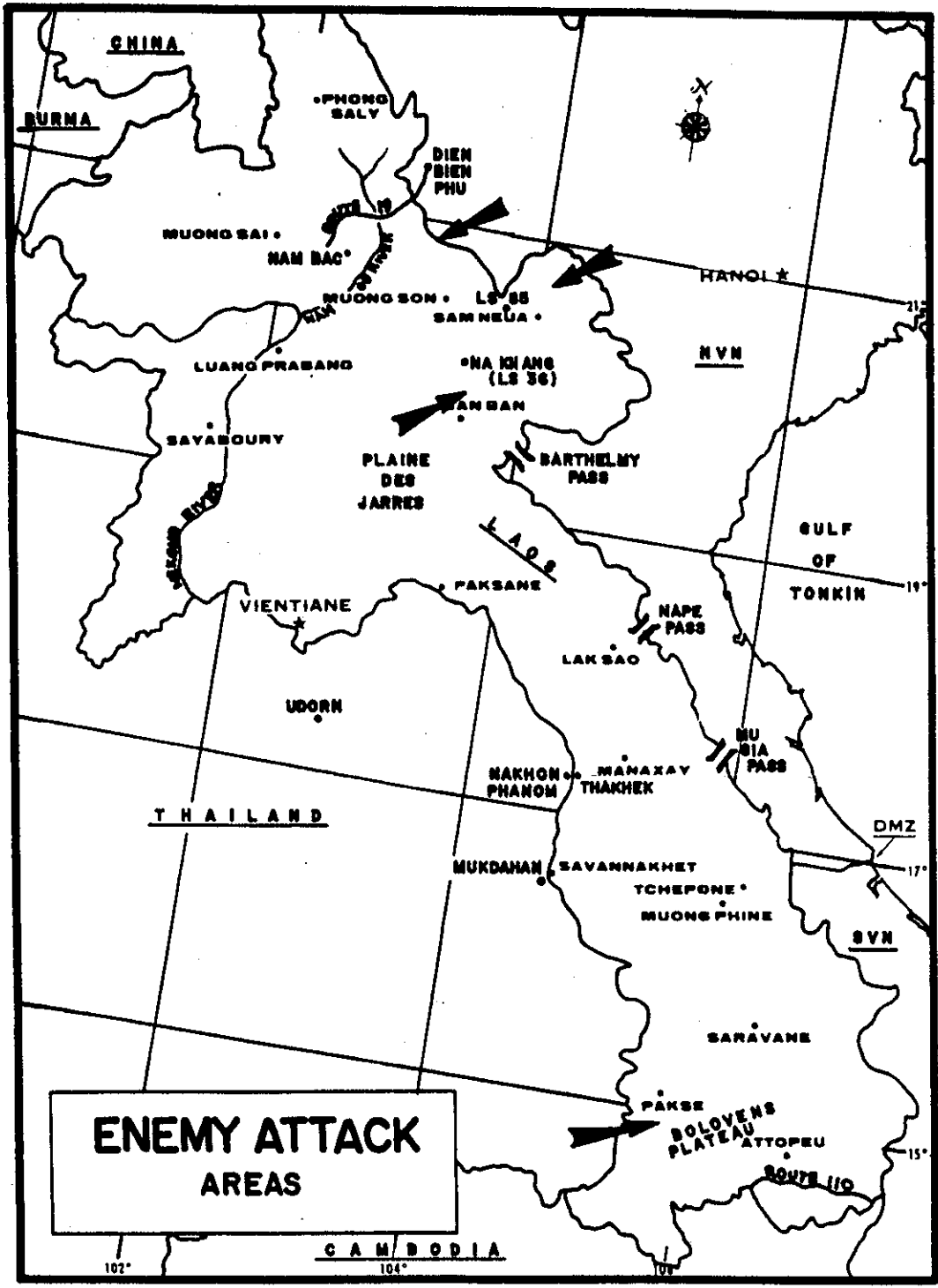


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Early on the morning of 2 February, a small enemy force of between 12 and 30 men conducted a "disastrously successful" sneak attack with rockets and small arms against Luang Prabang airfield. Following the 15-minute onslaught, the attackers withdrew. Friendly losses were six T-28s and two H-34 helicopters destroyed. Three other T-28s and one H-34 were severely damaged. The AOC was partly destroyed. Five soldiers were killed and six wounded--there were apparently no enemy casualties. ^{41/}

Since Luang Prabang was the Royal Capital and had previously been immune to attack, the incident was unprecedented. Perhaps because it was the Royal Capital, the Communists seemed to deliberately avoid hitting the city or damaging the runway. ^{42/}

In the extreme south, PL/NVA activity indicated a potential buildup in the area of the Bolovens Plateau. Although no attack materialized, the area was closely watched, because, if the eastern end of the Plateau were lost, the town of Attopeu would have been surrounded and hence untenable by the FAR. ^{43/} USAF and RLAf airstrikes conducted in the area of the Bolovens on 5-6 February were judged instrumental in halting the potential enemy thrust. ^{44/}

Activity for the remainder of the dry season was generally minor. In the friendly-held Nam Bac area, seesaw engagements were fought as friendly forces launched forays and spoiling attacks to keep the Communists off balance; Communist forces countered by retaking lost positions. ^{45/}

Site 52, north of Sam Neua, the most northeasterly ADC stronghold, was taken by the enemy on 4 April. The enemy attacked from three sides and had

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prepared an ambush to catch the retreating friendly troops in the fourth direction. The result was a demoralizing defeat for the defenders.^{46/} However, aside from these smaller activities, no major enemy drive had materialized before the coming of the wet season.

Wet Season 1967, Friendly Vacillation and Dissension

Friendly activity in the first half of the 1967 wet season matched the enemy's previous performance--relatively little was accomplished. Minor skirmishes appeared to have been the order of the day.^{47/} Spoiling actions now became the enemy's tactic. An abnormally dry period in June in northern Laos allowed the enemy to conduct some minor operations, no doubt calculated to forestall a friendly offensive. However, no offensive was planned.^{48/} The FAR concentrated on strengthening the Nam Bac area.

On 16 July, an even more destructive attack than the one in February was launched against the Luang Prabang airfield. An estimated 12 infiltrators hand-placed charges on most of the T-28s located at the field. Of the 11 T-28s nine were completely destroyed, with one other destroyed in all but name. A portion of the ammunition supply (containing fuzes and napalm) also was lost, although the main dump was not hit. Three friendly soldiers were killed and eight were wounded. No enemy was reported engaged.

The following data revealed the status of the RLAF T-28s:^{49/}

Before the attack, assigned	55
Destroyed	9
Major damage	1

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In early September, a short round incident on the southwestern side of the defenses around Nam Bac caused another delay. RLAF T-28s had inadvertently bombed their own troops, and these troops had fled the field leaving a gap in the perimeter. The defenses were unhinged, but, fortunately, the enemy did not attack at once. However, by mid-September that gap had not been reoccupied and, around the 20th, the position was taken by the enemy.^{59/}

Rumbles of dissension were heard from the RLAF. Even though nonrepresentation in higher echelons of command had been a cause of the coup attempt by the RLAF Commander, General Ma, in 1966, nothing had been done to correct this problem. The RLAF helicopter operation, a vital part of the supply mechanism, suffered from ineffective maintenance management, poor leadership, and a lack of guidance. In south Laos, low morale and inefficiency fostered the collapse of RLAF discipline, resulting, on 5 September, in a refusal by RLAF personnel to load strike aircraft. RLAF officers were generally reported as weak and absent from duty for long periods of time. Low pay, inadequate quarters, no messing facilities, poor leadership, and poor equipment were other complaints.^{60/}

In addition, commanders around the Thakhek area in central Laos expressed concern because of the shifts of troops from their area northward. Neutralists, whose integration with the FAR had not yet been achieved, were complaining of inadequate communications and dwindling rice supplies. To bridge the gap created by the disaffection of the RLAF, Thai-based T-28s were used more extensively. But the enemy was taking advantage of the lessening of airstrikes by increasing his probes around Nam Bac.^{61/}

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At the end of September, the offensive had still not begun. The position, which had been inadvertently struck and evacuated, and which subsequently was taken by the enemy, could not be recaptured. In early October, the piecemeal commitment of forces to counter enemy probes around Nam Bac was increasing friendly casualties. These forces were used outside of friendly artillery ranges and so had little support. Although reduced, this practice was not fully eliminated.^{62/}

In mid-October, supply problems and enemy activity were the excuses offered by the increasingly conservative-minded General Staff. They had become very concerned that the offensive should not meet with disaster. Meanwhile, the enemy was reinforcing, and by skillfully shifting his mortars, was causing heavier casualties among the defenders--but, for the time being, the enemy was content not to launch a major attack. FAR morale was sagging and delay was piling on delay.^{63/} It was becoming very late.

Dry Season, 1967-68--Initiative Lost

By November, the roads in Laos were practically open--in northern Laos, they were all in good shape. While the Nam Bac area was holding and airstrikes were helping, enemy activity was increasing at other places in Laos, which were still weakened due to transfers to Nam Bac.^{64/}

Gen. Vang Pao began to move some of his forces westward in an effort to link up with Nam Bac's defenders and ease enemy pressure. He was relatively unopposed, but movement was slow. The friendly forces at Nam Bac did not push eastward to facilitate a join-up.^{65/}

Finally, dissatisfied with the entire situation, 57 young colonels in the

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all-weather operations against the upper Route Packages. One of the earlier solutions attempted was to have a Pathfinder (EB-66) aircraft lead in fighter-bombers. The Pathfinder was to provide a radar bombing capability.^{71/}

Through June 1968 in the North

By February, the enemy had injected 3,000 new NVA troops into northern Laos.^{72/} The loss of Nam Bac in January, and the fall of Site 85 in March, turned loose large numbers of the NVA/PL forces, which had been tied down, investing these friendly positions. They proceeded to press their offensive and a great number of friendly positions in Gen. Vang Pao's Military Region II fell like dominoes. In March, the U.S. Ambassador reported:^{73/}

"Fall of Phi Thi (Site 85) in Sam Neua Province opens a new time of troubles for Vang Pao and the Meos of Military Region II. The size of the attacking forces and their heavy supporting weapons are greater than anything friendly troops can muster in the immediate vicinity. Therefore, there is no alternative but to evacuate friendly troop units and their dependents in order (to) maintain them intact for counterattack activity in rainy season... (Comments on refugee problem)...."

"It should be borne in mind that North Vietnam mounted attack of this size and intensity because it wished (to) eliminate U.S. installation, which had become "attractive nuisance" for them. Consequently, this vast uprooting of human resources and abandonment of useful territory is direct result (of) U.S., rather than RLG, operational interests."

"Site 36, which is used as forward launch base for ARS helicopters, is another U.S.-dedicated activity which will doubtless also attract enemy attention. Although it is more heavily defended than Site 85, it is questionable whether it can withstand a determined assault by seven NVN battalions, the strength we feel enemy is probably able to deploy against it."

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In an effort to match the obvious escalation of the Laotian war and inflict punishment on enemy supply areas long existing in virtual sanctuaries, steps were begun to increase USAF bombing in northeast Laos. The Ambassador stated: ^{74/}

"Most of the targets are in or lie close to towns and other centers of civilian population which Prime Minister has previously asked us to avoid. I went over list with Souvanna yesterday and we agreed to have U.S. photo-interpreters examine prospects for carefully controlled strikes against a number of Vang Pao's targets. We agreed to take a joint look at photography as soon as my people can get target folders assembled."

Plans were coordinated and forces were readied for strikes against the previously untouched targets, particularly in the areas around Sam Neua and Xieng Khouang. ^{75/} Unfortunately, no massive campaign was launched, largely due to a period of bad weather. A few sorties did strike these areas, but they served more to warn the enemy to make them less lucrative, than to devastate. ^{76/}

On 1 April 1968 (Laos time), the President of the United States ordered a cessation of American bombing above the 20th parallel. In the next few weeks, all U.S. bombing of BARREL ROLL was curtailed considerably, although some strikes were continued in the Site 85 vicinity against enemy positions, and also against enemy concentrations in the Site 59 area. ^{77/}

Near the end of April, difficulties over interpretations of Rules of Engagement and a period of bad weather caused a decrease in some USAF air activities in northern Laos. While enemy activity in these areas had eased

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considerably with the coming of the wet season, he inflicted one more large effort against Site 36. At the end of the month, about five enemy battalions concentrated about 30 miles south of Site 36.^{78/}

Site 36

Enemy probes had increased in intensity around the site in the last week of April. Pressures came primarily from the east and, for the first few days of May, the USAF sent 50 strike sorties to assist the Meo defenders. Seventeen A-1 sorties were especially effective on 5 May.^{79/}

Although the enemy had approximately eight battalions in the general vicinity, reports indicated he committed four to five against LS 36. Vang Pao's defenders numbered nearly the same amount, about 1,500 troops.^{80/} During the second week in May, the USAF devoted 215 of its total 239 sorties in BARREL ROLL to the site's defenders. The results were that an enemy push from the east was virtually destroyed. On the crucial day, 11 May, an additional 18 RLAF sorties were contributed.^{81/}

After a week of relative quiet, the enemy returned to his task about 20 May. But it had already been estimated that a major enemy attack would come near that point in time, and plans had been made to defend it with a minimum of 60 USAF sorties per day during the period of 20-22 May. Twenty-four first priority targets and 23 second priority targets had already been selected and validated.^{82/}

Seventh Air Force agreed to the plan, but cautioned:^{83/}

"Request that these strikes be applied only to those

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targets indicated in referenced message or more lucrative targets in the immediate area in defense of LS36 and not be diverted to other areas as allocation of this amount of air effort to the BARREL ROLL area draws down upon our ability to apply badly needed effort in other areas of 7AF responsibility."

A meeting was held between 7AF representatives and representatives of the Vientiane Embassy on 22 May, to determine future requirements for additional air support for Site 36. ^{84/}

The enemy thrust had been blunted and, in early June, Gen. Vang Pao opened a Meo drive back up the salient, toward Sam Neua, which had been lost. (See Fig. 4.) His tactics were to utilize small guerrilla units to find and fix the enemy; then, large units would move to destroy them. By 1 July 1968, he had made moderate headway. ^{85/}

South Laos

In south Laos, 1967 ended with the PL/NVA forces moving in their traditional early dry season roles of foraging and forcing the friendly units toward the cities, thereby opening the countryside to exploitation by the communists and allowing road repairs and construction to proceed. But, as in the north, three new NVA battalions were introduced in January, and the enemy began expanding operations westward. By the end of February, NVA increases in the south approximately matched those in the north of 3,000 men. ^{86/}

During March and April, enemy forces continued to be aggressive. They threatened, and, in some cases, virtually surrounded a number of cities among them Saravane, Attapeu, and Thakhek across the Mekong from Nakhon Phanom. Friendly forces were rendered relatively ineffective. Despite the fact that

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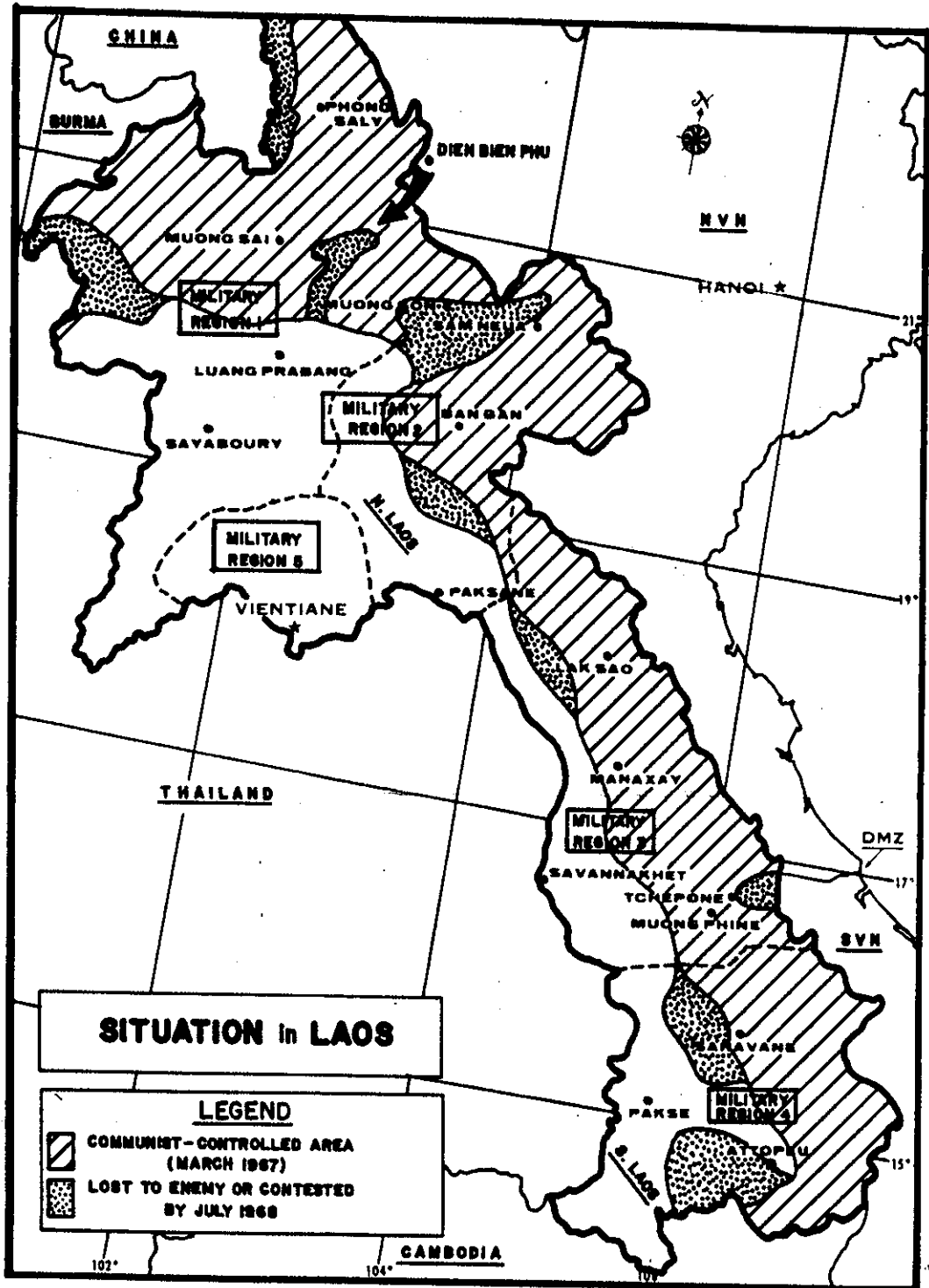


FIGURE 4

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crushing defeats could have been administered to beleaguered defenders in a few of these cities, the enemy did not choose this course. For example, it was estimated that nearly 2,000 enemy troops surrounded Saravane at the end of February. They kept up pressure, but did not launch a final assault. It was unknown whether the enemy was intent on "nibbling tactics", as he had followed at Nam Bac or was afraid to concentrate for a final assault, making himself vulnerable to airstrikes. In the case of Saravane, he may have been swayed by Souvanna Phouma's threat to enlist outside assistance from the 1962 Geneva Accords signatories, if Saravane fell.^{87/} Whatever the reason, friendly forces were effectively neutralized and boxed up.

The 1968 gains by the enemy put new strains on the Royal Laotian Government. There were fears of disorders in Vientiane and Luang Prabang, but nothing of magnitude developed. A reorganization did begin in the upper echelons of military command, however. The technical details were not so important as the fact that units were restructured, and the young colonels were given more power and a greater voice. A few of the older generals were booted upstairs to posts and positions which carried more prestige, but little power.^{88/}

The FAR began a more concentrated effort to pinpoint targets for airstrikes. Meetings were held to decide what areas would be held and consolidated and what areas would be conceded to the enemy.^{89/}

In the south, enemy pressures had eased sufficiently at the end of April for the FAR to resume moderately aggressive activities. A limited friendly effort around Houei Mune, about 60 miles west-northwest of Saravane offered a good example.^{90/}

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This operation moved well against light opposition. The gain, however, was not as significant as the methods employed. For the first time, the RLAF was brought in on the planning of an operation at the beginning. Colonel Ly, the Army Commander, ran the operation forcefully, praising or chastising subordinates, and even personally briefing the RLAF pilots before their missions. Excellent coordination resulted, with exemplary air-to-ground communications. Some of the RLAF T-28s flew Combat Air Patrol (CAP) missions over the battlefield and were called in to assist the advance and hit enemy rear areas. The RLAF flew 99 sorties in support and was credited with a large part in the victory. It was hoped that this operation would serve as an example of what ^{91/} could be done with aggressive leadership, planning, and coordination.

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CHAPTER III

ENEMY LOCs AND RULES OF ENGAGEMENT

Enemy LOCs and Tactics

In a Command Briefing at 7/13AF Headquarters on 11 May 1967, the 7/13AF Director of Intelligence stated: ^{1/}

"In central Laos we are fighting...an air war that has its primary, if not its sole purpose, the interdiction of lines of communication....we are primarily oriented against roads, little improved roads that snake across the countryside, down through the valleys, mostly under the trees, into the canyons where not only is it difficult to find a target, but it is difficult to find a road from time to time. These are the main roads of the Ho Chi Minh Trail, over which trucks travel at night to carry materiel from sources in North Vietnam on an end run through Central Laos into the supply areas and the base camps of both the Viet Cong and the North Vietnamese in South Vietnam"

The 7AF Operations Order, which outlined activities in Laos, stated that the primary mission in Laos was armed recce associated with the enemy lines of communication. Provisions were also made for giving air support for the military forces of the RLG, "on a recurring basis". ^{2/}

One PACAF publication in January 1967 pointed up the increasing importance of supply lines through Laos for enemy forces in SVN: ^{3/}

"The CINCPAC--estimated 50,000 man enemy in-country (South Vietnam) increase for 1966, coupled with expanded USN maritime programs has added to the requirement for overland resupply through Laos. Thus the truck traffic in Laos, or lack of it, should signal the enemy's intentions for the next six months even more clearly than before."

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The Ho Chi Minh Trail was not the sole avenue of supply into Laos, but it was the main one. In the northeast, the Routes 6 and 7 complex sustained enemy units in the Plaine des Jarres region. Still further north, Route 19, which entered Laos from Dien Bien Phu, was the main artery. However, goods and troops transported along these northerly routes were not usually destined for SVN or southern Laos.

In the extreme south, another supply line stretched northward from Cambodia. This avenue, the Sihanouk Trail, primarily used routes associated with Highway 110. This system blended with the southern portions of the Ho Chi Minh Trail. In addition, during the wet season, or whenever possible, waterways were also used to transport men and materiel. These waterways offered primary or alternate supply lines and added depth to the entire system.^{4/}

History of Ho Chi Minh Trail

A rough approximation of this LOC was in use as early as World War II, when guerrillas traversed this general area. After that war, Viet Minh bands trekked the jungle trails, until the French control of the seacoast weakened. When Vietnam became divided in 1954, NVN agents and Communist-indoctrinated returnees to SVN used the trail.^{5/}

By 1964, the Ho Chi Minh Trail was developed into a dry-season truck route (See Fig. 5), which entered Laos via Routes 8 and 12 at the Nape and Mu Gia Passes, respectively. The motorable routes joined near Thakhek and, following Route 13, moved south to just east of Savannakhet, before coursing eastward again on Route 9. West of Tchepone, traffic could either continue eastward

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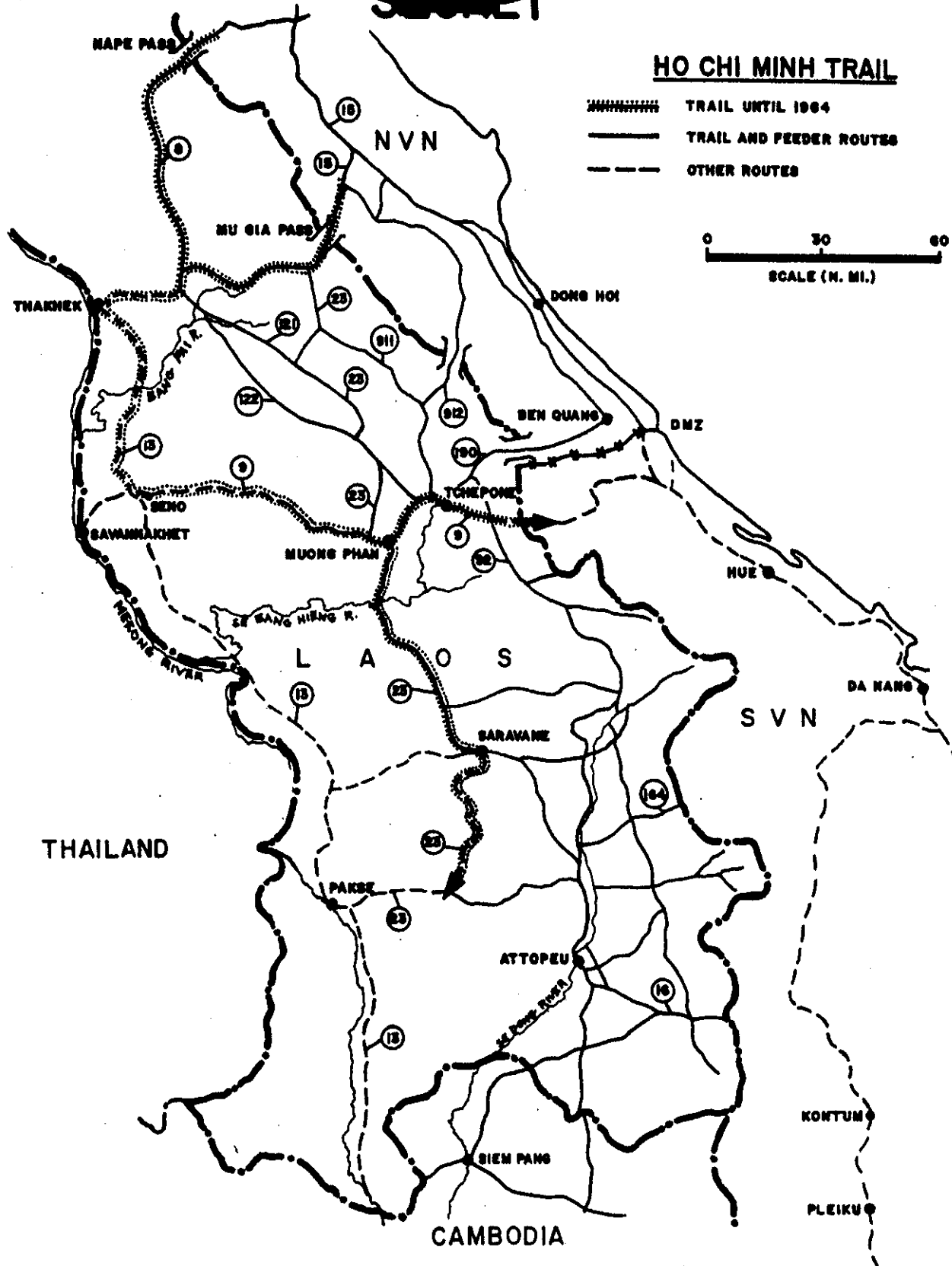


FIGURE 5

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toward the SVN border on Route 9, or turn south again on Route 23.^{6/}

Only a handful of jungle trails ran directly south from Mu Gia. In fact, even the route structure described above was open only during the dry season (approximately October through April). Furthermore, there was no capability for covert supply along this system, because Thakhek was held by RLG forces.^{7/}

By 1965, the Trail had become a network of several hundred miles of motorable roads; the building and refining had not ceased since that time.^{8/} Construction of numerous bypasses and multiple routes had compounded the problem of interdicting these LOCs. With a minimum effort, enemy ground tactics in the central and southern portions of Laos had aimed to isolate and neutralize friendly forces by boxing them in certain towns during the dry season.

Operation of the Ho Chi Minh Trail

One document, distributed in April 1967 by the 7/13AF Director of Intelligence, best described operations on the trail:^{9/}

"The North Vietnamese have a considerable logistics system, manned by a relatively large number of personnel along the corridor routes to render assistance and to man way stations. It has proved an effective system despite our best efforts to disrupt it...."

"Generally vehicle shelters and supply storage areas are located at intervals varying from 10 to 30 kilometers, depending on the terrain. One type of vehicle shelter in common use consists of 30 to 50 individual hillside excavations with earth roofs, each large enough for a single truck. In the same general area as the truck parks, but 500 to 1,000 meters away are

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an equal number of supply shelters. The facilities are usually located from 500 to 1,000 meters from the road.

"In addition to the supply shelters mentioned above, work camps, military structures, construction and repair equipment parking are all usually 500 meters or better from the main road. Though the enemy may not be directly familiar with the restrictions placed upon our armed recon aircraft, experience has taught him his chances for survival increase as he moves back from the road. Each shelter area is commanded by a North Vietnamese officer who controls truck convoy movements and provides assistance to disabled vehicles. Normally, convoys arrive at shelter areas prior to sunrise. After arrival, each truck's cargo is unloaded at one of the supply shelters and then the truck is parked in a vehicle shelter. Drivers sleep in hammocks located in the jungle nearby. After sunset, the trucks are reloaded and the journey continues.

"The North Vietnamese officer is also responsible for determining if a convoy can pass his area without being caught between shelter areas after sunrise, and for notifying the next shelter area of a convoy's approach. Every third to fifth shelter has a refueling capability. Telephone communication is maintained between the shelter areas... Each shelter has 30 to 60 North Vietnamese soldiers, the actual number depending on its size, its area of responsibility, and the frequency with which the road or shelter area is bombed. These soldiers are equipped with the necessary tools to make quick road repairs.

"Supplies are normally moved by the shuttle system in which groups stationed at one area moved supplies a definite distance, usually between three and seven shelter areas, and then return to their point of origin. This eliminates the need for a guide as each driver is familiar with his particular route. It has the added advantage of allowing the trucks to be serviced by mechanics familiar with the individual vehicles."

This system of using certain trucks for only a portion of the supply route dovetailed the practice of stockpiling supplies at various locations along the route. ^{10/} Under favorable circumstances (as during the 1967 TET truce from 8-12 February), periods of exceptionally good weather, or when simply

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taking a risk, the enemy would move large convoys through generally constricted areas (for example, the Mu Gia Pass during 1967 TET).^{11/} By operating with numerous stockpiles and by devoting a number of trucks to only specified segments of the route, the enemy created a degree of flexibility which allowed him to overcome a time of bad weather, or a time when road interdiction might hinder his supply moves.

Three shots generally signaled mechanical difficulties, but help was usually nearby. Repairable vehicles were towed to the next area for repairs; non-repairable trucks were stripped of parts and moved off the road. Generally, only minor maintenance--welding and parts replacement--was performed on the Trail.^{12/}

Warning of approaching aircraft was conveyed by gunfire, a system of warning lights, if there were unobstructed visibility, lookouts, or movable road barriers. If an aircraft were heard or flares were seen, the trucks halted. If the plane stayed at altitude or at a distance, the trucks continued with shielded headlights. Should the aircraft be low and close, the vehicles stopped, lights were extinguished, and the drivers took cover in the numerous shelters and foxholes along the route.^{13/}

The lead truck in a convoy used a low headlight; the others followed with a low red light. Another method was to use a small light underneath the truck chassis, which gave the driver a forward visibility of about five meters. The vehicles were more vulnerable at fords, for lights had to be raised to achieve the proper alignment for crossing. They were better targets in open or defoliated areas. It was probable that enemy patrols swept the route areas

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periodically to allow convoys to move without being detected by Road Watch Teams. ^{14/}

Although there was some mechanized equipment, most road repairs were done manually, using hand tools such as hoes, picks, shovels, and axes. Dynamite was commonly used to clear obstructions or obtain fill material. The essential items used in road repairs were wood, bamboo, rock, and earth fill; these were all readily available. Corduroying with logs, limbs, or bamboo helped prolong road use in bad weather. Log bridges were built over small streams and depressions. ^{15/}

The enemy also has used underwater bridges to facilitate stream crossings, and in clear areas sometimes created an artificial canopy by building trellises and planting fast-growing vines. Fortunately, for the enemy at least, there were no major bridges on the Trail's Laotian routes. ^{16/}

The 7/13AF Director of Intelligence report concluded: ^{17/}

"...the enemy has been successful in keeping its major routes open. Road workers, both military and civilian, leave their foxholes to repair bomb damaged roads as soon as a strike is over. Often these workers can repair badly damaged roads within a few hours.

"The system owes its success to the vast numbers that are devoted to keeping the road open and the trucks moving. The trucks are backed up by bicycles, pack animals, and coolies capable of bypassing the most severe interdiction. As long as the vast pool of labor exists and continues to persist in its efforts to move men and supplies south, our task of countering these operations will be extremely difficult."

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Defenses Along the Trail

To help protect vital route segments, the enemy relied to a great extent on antiaircraft weapons. Although their coverage was not so sophisticated or complete as that employed in the route packages of NVN, especially near Hanoi, they were effective, nonetheless. In addition to numerous small-arms weapons, it was estimated the enemy had 185 antiaircraft guns in Laos as early as February 1967. Forty-six of these were AA machine guns of 12.7 and 14.5-mm; 139 were light AAA guns of the 37- and 57-mm variety.^{18/}

These guns were highly mobile and shifting their positions made them more effective, since it became more difficult to fix their location over long periods of time. In 1967, the enemy began using searchlights to assist in spotting targets.^{19/}

In April 1967, the enemy introduced twin-mounted 23-mm AAA weapons, and there were indications that the enemy had developed a fairly reliable acoustical or radar tracking system to direct these guns.^{20/}

Since a considerable part of the USAF interdiction effort was supplied by slower propeller aircraft, enemy antiaircraft fire was particularly dangerous. A message in mid-April 1967 from Nakhon Phanom RTAFB, Thailand, pointed up the enemy's effectiveness:^{21/}

"The area of greatest concern to everyone associated with the night program here (interdiction) is the significant increase in ground fire reaction recently... it has been necessary that we make operational adjustments. The truck kill rate has dropped since the ground fire picked up and we have definitely lost some

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effectiveness... (the new adjustment was bombing on a single pass)... It will be a rare situation when it will be possible to stay in an area and dig for truck kills as has been done in the past. If the ground fire situation continues to intensify, it will be necessary to adjust the tactics again and possibly conduct an intensive counter-ground fire program... (Policy was)... that we will continue working the area and will work where the traffic is, but that consideration will be given to defenses and truck attacks will not be pressed into areas of extensive ground fire. Furthermore, as a general rule, prop aircraft will not attack gun positions unless the pilot can determine an approach which will avoid a direct confrontation with the site."

Figure 6 indicated the approximate percentage of USAF strike sorties, which drew enemy AA reactions in Laos, by month from January 1967 through June 1968, and USAF Aircraft Combat Losses are depicted in Figure 7. The data represented all of Laos, and included BARREL ROLL in north Laos. Since BARREL ROLL received fewer sorties than southern Laos, ground fire reaction figures were considerably lower. Therefore, if STEEL TIGER were viewed alone, the reaction figures would be slightly higher.

Figure 6 also pointed out two other important facts. First, during the summer months, when the wet season prevailed and truck traffic decreased, enemy ground fire fell off. The enemy moved many of his guns from Laos to RP I in NVN during this season. They were moved north: (1) To keep them from being stranded in the south due to impassable roads; and (2) To enhance the AA ^{22/} protection for newly-planned infiltration routes in RP I.

In October, the guns began to be returned to STEEL TIGER--in even greater numbers. One report stated: ^{23/}

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USAF SORTIES WHICH DREW ENEMY FIRE

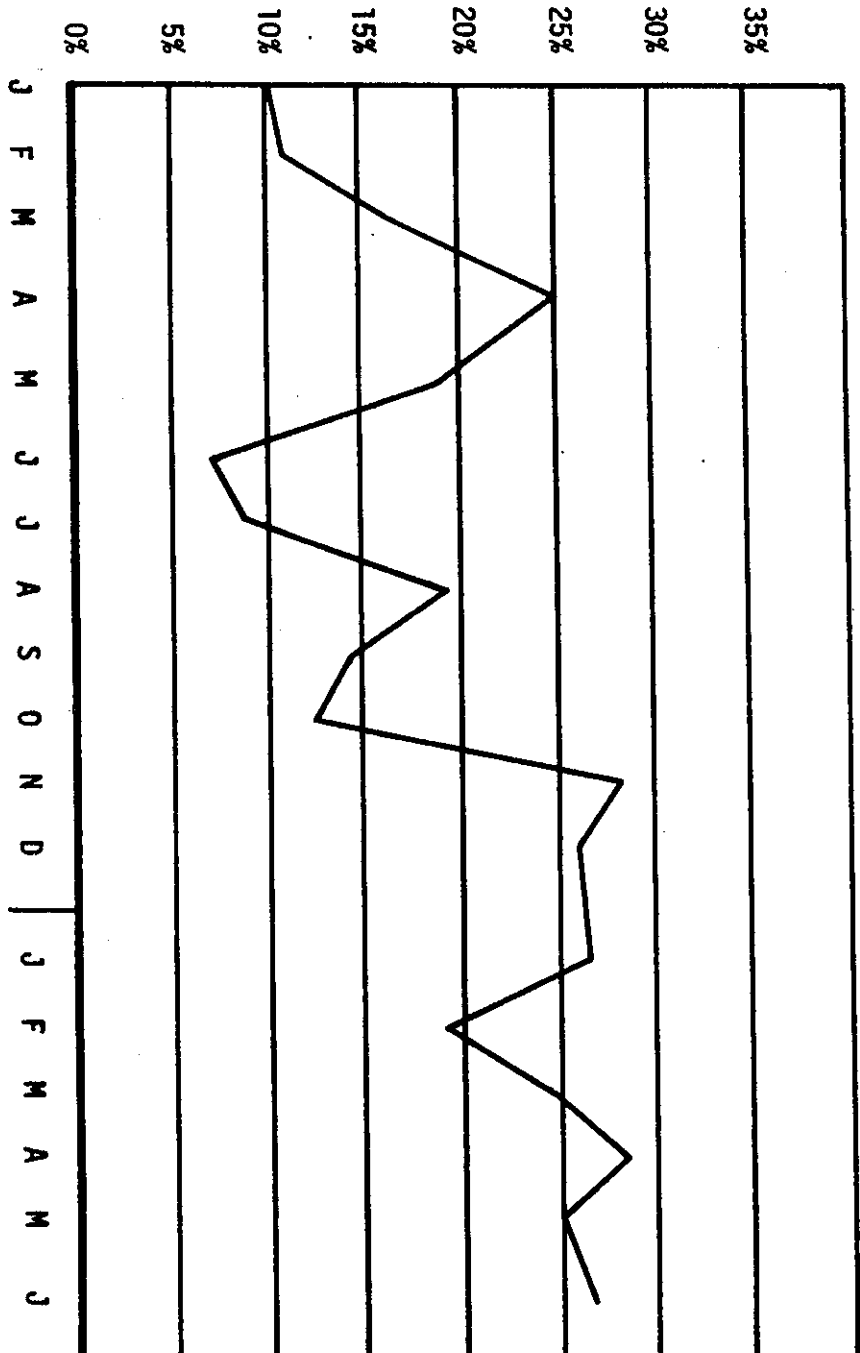


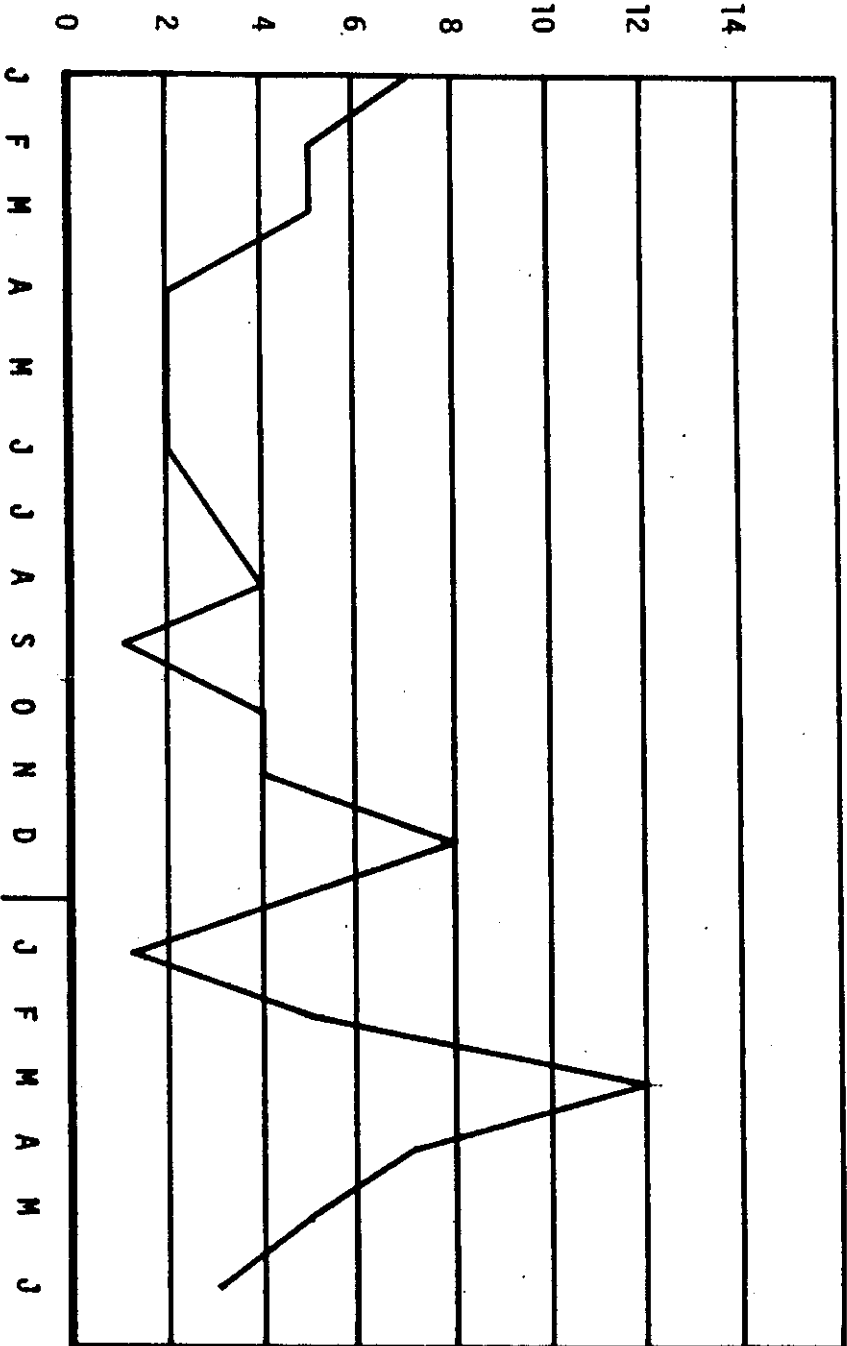
FIGURE 6

1967

1968

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USAF AIRCRAFT COMBAT LOSSES IN LAOS



1967

1968

FIGURE 7

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"The mass influx and exodus of AAA in STEEL TIGER are proving to be yearly events. The dry Northeast Monsoon Season triggers a large scale flow of weapons into the area to protect stepped up infiltration. The majority of the same weapons are moved to Route Package I and TALLY HO (north of the DMZ) just prior to the Southwest Monsoon Season. This seesaw tactic is expected to continue with the number of guns involved increasing each season."

Figure 6 also showed quite clearly that the percentages of ground fire responses to sorties flown increased sharply in November. Data for 1968 were substantially higher than corresponding months of 1967. More areas were being termed "high threat areas", and, in some cases, were prohibited to slower prop aircraft.

Rules of Engagement

Rules of Engagement (ROE) were agreed upon by CINCPAC, COMUSMACV, and the American Embassy in Vientiane. They were directive in nature and compliance was required by all U.S. military forces carrying out activities in Laos. Supplementing these rules, and usually more restrictive, were operating rules and policies established by the Commander, 7AF.^{24/} Rules of Engagement formally stated what was permitted or forbidden in air operations.

In January 1967, the seven sectors, A through G, delineated armed reconnaissance areas in BARREL ROLL and STEEL TIGER (North, and TIGER HOUND). (See Fig. 1.) In these areas, U.S. aircraft were allowed to conduct strikes outside of villages, against targets of opportunity. Any target of opportunity could be struck, day or night, provided it was located within 200 yards of a motorable trail or road.^{25/}

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USAF AIRCRAFT COMBAT LOSSES IN LAOS

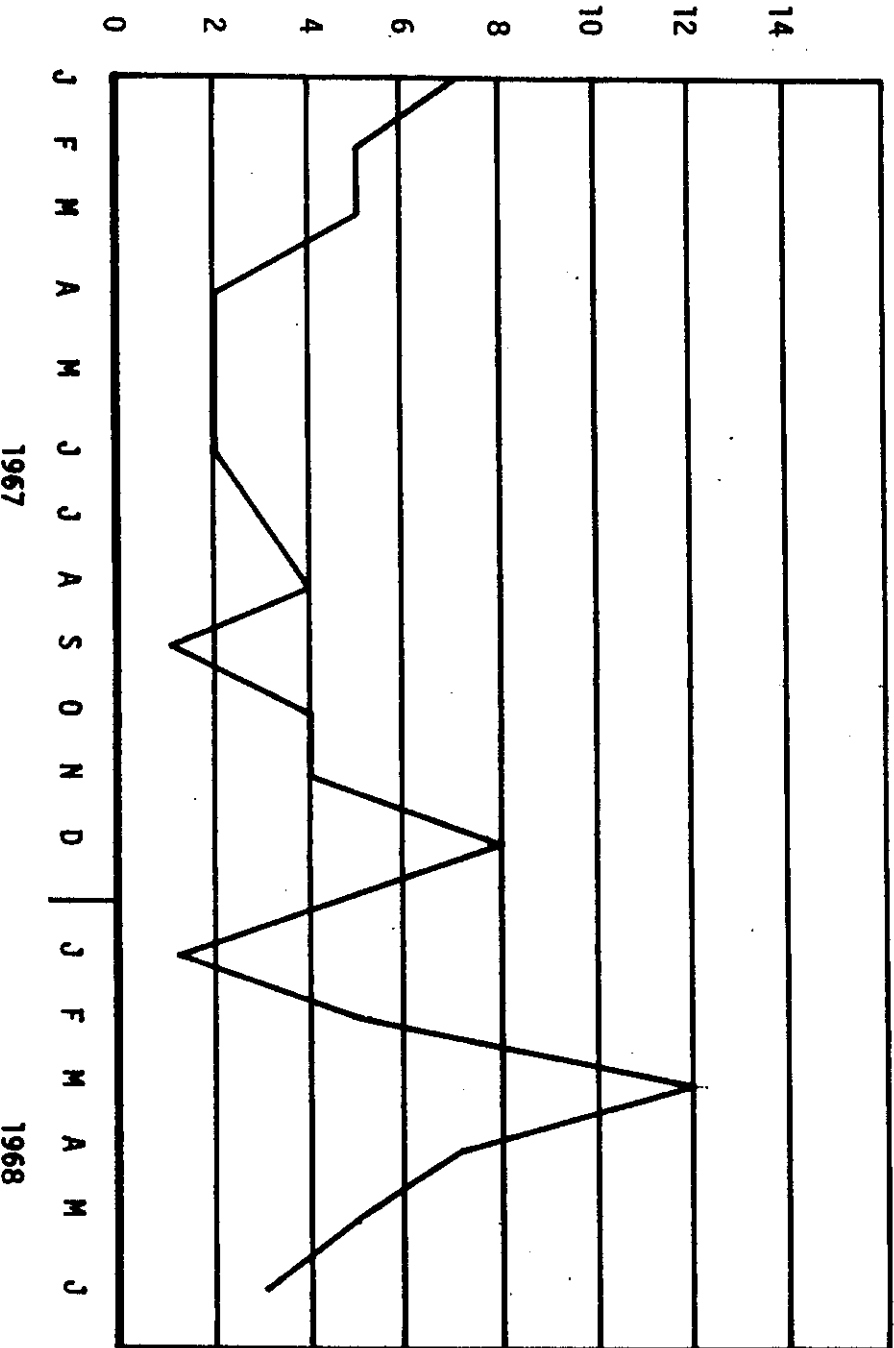


FIGURE 7

1967

1968

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"The mass influx and exodus of AAA in STEEL TIGER are proving to be yearly events. The dry Northeast Monsoon Season triggers a large scale flow of weapons into the area to protect stepped up infiltration. The majority of the same weapons are moved to Route Package I and TALLY HO (north of the DMZ) just prior to the Southwest Monsoon Season. This seesaw tactic is expected to continue with the number of guns involved increasing each season."

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Provisions were in force to strike other types of targets. Fixed targets, targets of opportunity outside the armed recon areas, or targets of opportunity within the armed recon area, but more than 200 yards from a motorable road or trail, could also be attacked. However, one of the following stipulations had to be met:^{26/}

- The target had to be a validated RLAF "A" or "B" target.
- Approval had to be obtained from AIRA, Vientiane, AIRA, Savannakhet, or an AIRA, FAC.
- Gunfire had been received from the target.

Airborne and ground FACs, plus the MSQ-77, aided the strike aircraft. The MSQ-77 could be used to guide strikes against validated targets, day or night, and in all weather. FACs were required:^{27/}

- On close air support missions.
- When called for by the American Embassy on certain specified targets.
- Within five kilometers of the Cambodian Border.
- On all night strikes against fixed targets, unless under MSQ direction.
- Against large traffic on streams and rivers, other than the main stream of the Song Ma River.

It was mandatory that aircraft, which carried out strikes without FAC or MSQ assistance, confirm their position by radar or TACAN beforehand. If any doubt existed concerning his position, the pilot was not to expend his ordnance.^{28/}

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Two zones had been established in the STEEL TIGER area of Laos which had slightly different rules. One was called CRICKET WEST (and FRINGE). The CRICKET area had originally been a particular region, near the Nape Pass, in which U.S. aircraft conducted concentrated interdiction. As enemy ground forces threatened friendly positions to the west of the interdiction area, U.S. aircraft lent support. This area was called CRICKET WEST. Further extensions of these operations were dubbed CRICKET FRINGE. All strikes in these latter operations had to be FAC-directed.^{29/}

The other unique region was called the STEEL TIGER special operating area. Established in November 1966, it was a narrow strip of the eastern Panhandle of Laos that stretched from just north of the DMZ, along the NVN and SVN borders, south to Cambodia. (See Fig. 1.) This area had been set aside to provide additional flexibility in operations. Armed recon without FACs was authorized in this strip against all enemy activity. This allowed the effective use of sorties diverted from ROLLING THUNDER which arrived over Laos, when there were no FACs available or when the strike aircraft had little fuel remaining.^{30/}

U.S. aircraft were prohibited from flying over a number of Laotian cities. Luang Prabang and Vientiane had to be avoided by at least 25-NM; Attopeu, Pakse, Saravane, Savannakhet, and Thakhek were to be skirted by 10-NM and 15,000 feet. Later, Muong Phalane was added to the list. However, A-1 propeller-driven aircraft were authorized to penetrate within 10 miles of Attopeu when attacking targets along Route 110, a major enemy artery in the extreme south.^{31/}

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The Rules of Engagement were continually adjusted to allow for a changing ground situation or to avoid international complications. These adjustments were either permanent or temporary. For example, in January 1967, BARREL ROLL was expanded to cover a highway route being used by the enemy; in February, Russian complaints about strikes in the Khang Khay region temporarily halted strikes there; and, also in February, a proposed International Control Commission meeting at Xieng Khouang put that locale off limits.^{32/} At the very end of February, a major revision in the Rules of Engagement was carried out.

Short Rounds

The increased tempo of air operations over Laos in 1966 had caused a correspondingly rising number of inadvertent strikes. The tragic trend continued into early 1967. This was an extremely sensitive issue to the Laotian Government, which was struggling against a stubborn enemy who was attempting to win adherents to his cause.

Each short round was damaging to the Royal Laotian Government, because it promoted fear and distrust among the people. The U.S. quickly followed up inadvertent strikes by sending teams into the attacked area, which provided and arranged medical care, settled claims, repaired structures, and removed undetonated explosives. However, all commanders were aware that some means had to be devised to reduce, if not eliminate, these tragic occurrences.^{33/}

The inadvertent strikes were mostly concentrated in the STEEL TIGER area, which was the area of major U.S. air effort. In essence, the same factors which inhibited U.S. air operations, promoted short rounds. An elusive enemy, poor

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"Nevertheless, experience has shown that we cannot repeat not give RLG iron-clad assurances that positive controls stipulated in Rules of Engagement are always observed or, even if they are observed, are foolproof against error...."

"In order to resolve this dilemma, we are attempting (to) negotiate a compromise arrangement with RLG. This proposal would preserve the bulk of STEEL TIGER and TIGER HOUND areas under current Rules of Engagement, but would place westernmost reaches of these areas under positive FAC control."

Diplomatic pressure was not ended. At the end of February, the Ambassador reported to the Secretary of State: ^{41/}

"...Souvanna then asked that we undertake arrangements with the Lao Air Force to develop system which would prevent recurrence of such errors. He felt that it would probably require exclusion of all jet aircraft from the general region, leaving operations to propeller-driven planes which 'move slowly enough to know where they are.'"

Meanwhile, the USAF did not treat this incident lightly. After extensive study and examination, an element of pilot error was found to have been a contributing cause. The actions taken emphasized command concern. The Commander, 7AF, wrote: ^{42/}

"It is directed that the flight leader be relieved of his duty and given a verbal reprimand. The seriousness of this offense must be brought to the attention of all crews. War is cruel enough without exposing the innocent. All unit Commanders are expected to demand the highest degree of professional performance from their crews...."

Revised Rules of Engagement

Discussions between RLG officials and the American Ambassador moved to a conclusion and new Rules of Engagement for STEEL TIGER were put into effect

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early in March. Basically, the concept of armed recon areas D, E, F, and G were changed. South Laos was divided, in effect, into four north-south zones, with increasing Rules of Engagement restrictions as they were arranged toward the west; i.e., toward friendly-held territory. (See Fig. 8.)

The easternmost region, called Zone I, was similar to the previous special operating area. It remained a "free fire area" in which all enemy activity could be attacked without FAC control; however, confirmation of aircraft position was stressed.^{43/}

Zone II had Rules of Engagement like the earlier armed recon areas (D, E, F, and G). Zone III was made a FAC control area. No strikes could be made in this area without positive FAC control (later, clarifications were made to include MSQ-77 direction as permissible, too). Zone IV, which extended westward from the other zones, and included most of south Laos, could not be struck without specific permission from AIRA, Vientiane.^{44/}

These alterations, while reorganizing areas, in essence, changed little. A message from the AIRA to 7AF summed up the substance:^{45/}

"The new feature...is essentially Zone III which places sensitive area of STEEL TIGER in special category similar to that practiced in CRICKET, but slightly less rigid than practiced in South Vietnam."

Easing of Short Rounds - Channel 77

Unfortunately, the rash of short round incidents did not materially decrease through March, even though Rules of Engagement were revised. Even

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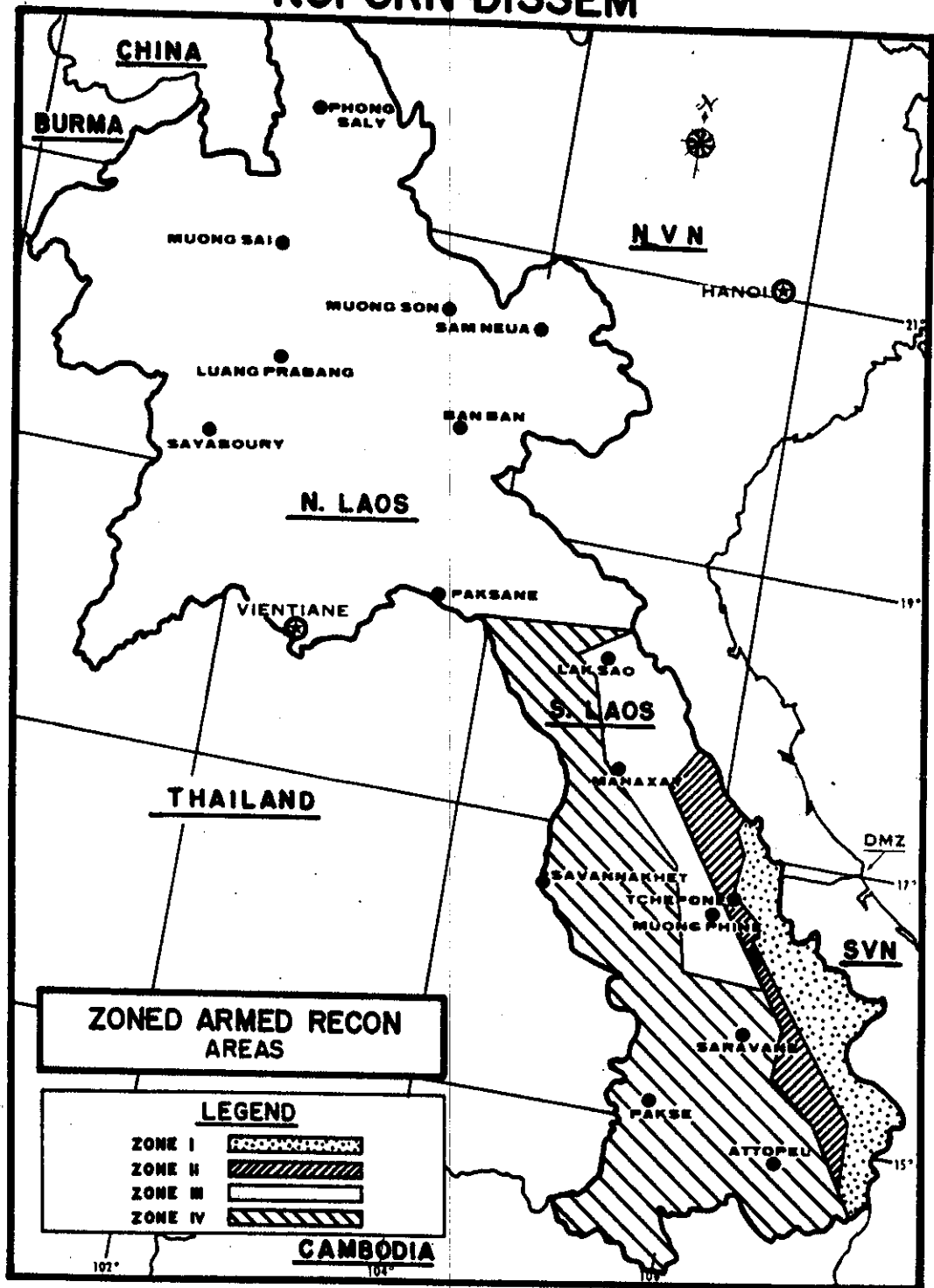


FIGURE 8

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Muong Phalane was not immune. Ever increasing emphasis on professionalism and the fact that pilots were not to expend unless absolutely sure of their targets was not decreasing the frequency of mishaps.^{46/} The Commander, 7AF, acting on his prerogative to establish operating rules (not to be confused with Rules of Engagement), directed that all strikes in Laos had to be FAC- or MSQ-directed.^{47/} In the ensuing coordination, it was agreed that A-26, A-1, and T-28 aircraft equipped with compatible ground-to-air radios could serve as FACs.^{48/}

Two other factors had helped increase the number of inadvertent strikes. They were bad weather and a lack of navigational aids. Pilots sometimes arrived over their assigned target areas only to find them weathered in. In searching for a "hole", they sometimes got lost. If they did find a "hole" and descended, it was difficult to reestablish their positions positively, because of the inadequacies of the navigational aids at low levels. In fact, a number of inadvertent strikes in Laos were made at the end of March and in early April without the use of FACs. Although violating the directive issued by the 7AF Commander, the cause was that pilots had believed they were actually over NVN, which could be struck without FACs.^{49/}

The problem of inadequate navigational aids for central Laos had been realized. Not only was this affecting positioning, it was also hurting effectiveness. On 9 February, the 634th Tactical Unit Operations Center (TUOC) at Nakhon Phanom reported to 7/13AF:^{50/}

"TACAN reception from Channel 89 (Nakhon Phanom), Channel 109 (Dong Ha, SVN), and Channel 72 (Saravane) is not adequate to insure pinpoint location of the LOC in STEEL TIGER area. During night operations

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TACAN radial/distance is the only feasible method for armed recon aircraft to locate prebriefed or UTM coord. targets. To acquire a lock-on the aircraft must climb to altitudes which will guarantee line of sight reception. Climbing to sufficient altitudes which will guarantee line of sight reception results in loss of the element of surprise, excess fuel consumption, ineffective flare drops, and less than optimum positioning of attacking aircraft for quick strike under first flare...Request action be taken to locate a TACAN station at Lima Site 61, Muong Phalane, Laos."

Similar recommendations were put forward by various organizations and commands. It was seen that placing a TACAN at Site 61 would serve to improve the navigational situation in the area, cut down on short rounds, and demonstrate again USAF concern to give more protection to that village against inadvertent strikes. ^{51/}

A TACAN, Channel 77, was established at Lima Site 61 in early April 1967. Seventh Air Force commented on 5 April on procedures: ^{52/}

"Subject TACAN was installed as an additional means of precluding further inadvertent bombing incidents in Laos.

"Aircrews operating in SL (STEEL TIGER) sectors Delta and Echo will crosscheck position with Channel 77 and one other TACAN before releasing ordnance.

"Aircrews operating in sectors Foxtrot and Golf will do the same or use a combination of two other TACAN channels.

"Above policy does not negate requirement to fully utilize all nav aids in determining position prior to ordnance release."

Channel 77 at Site 61 functioned until Christmas night 1967, when a combined PL/NVA force overran the site, destroyed the equipment, and killed two of the operators. To fill the gap created by this loss, a portable TACAN, Channel 99, was installed at Mukdahan, Thailand, just across the Mekong River from

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By 3 May, it was settled that, in effect, all LOC portions of A, B, and C sectors could be hit as part of the enemy logistics system (excluding the town center of Sam Neua) up to 10 NM of the NVN border. COLLEGE EYE and FAC control applied.^{59/}

As the situation around Site 36 intensified, the Ambassador was mistakenly led to believe that COLLEGE EYE aircraft controlled USAF strikes in all of BARREL ROLL, and strikes could not be carried out without COLLEGE EYE. Since COLLEGE EYE was airborne only 19 hours each day (21 if alerted soon enough), he was concerned that no strikes could be carried out when COLLEGE EYE was not on station. In such a condition, an attack against Site 36 might have had to be handled without air support.^{60/} The fact was explained, however, that COLLEGE EYE controlled only A, B, and C armed recon sector strikes, and, since Site 36 was outside these sectors, COLLEGE EYE presence or absence was no factor.^{61/}

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B-52 SORTIES IN LAOS

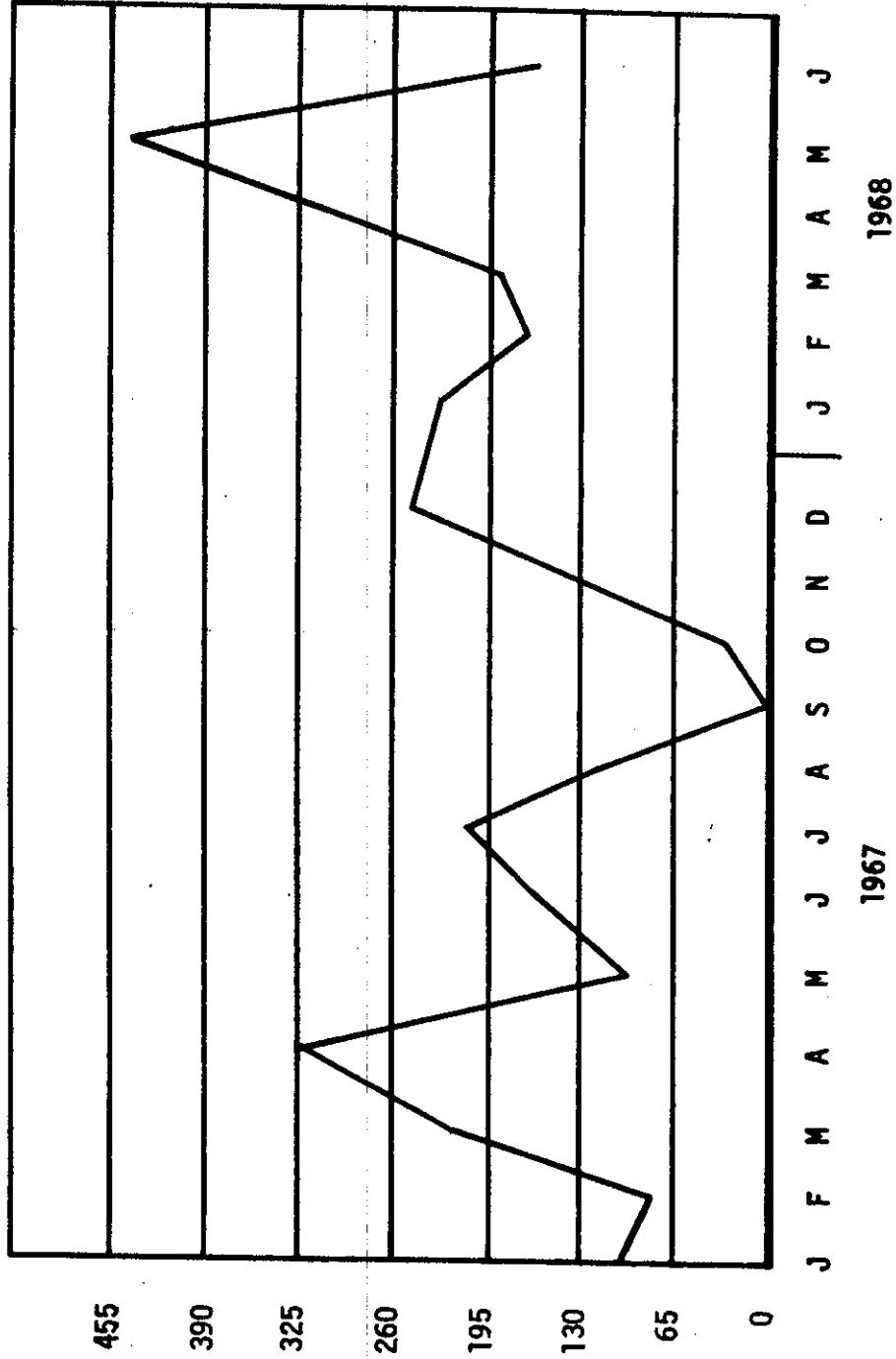
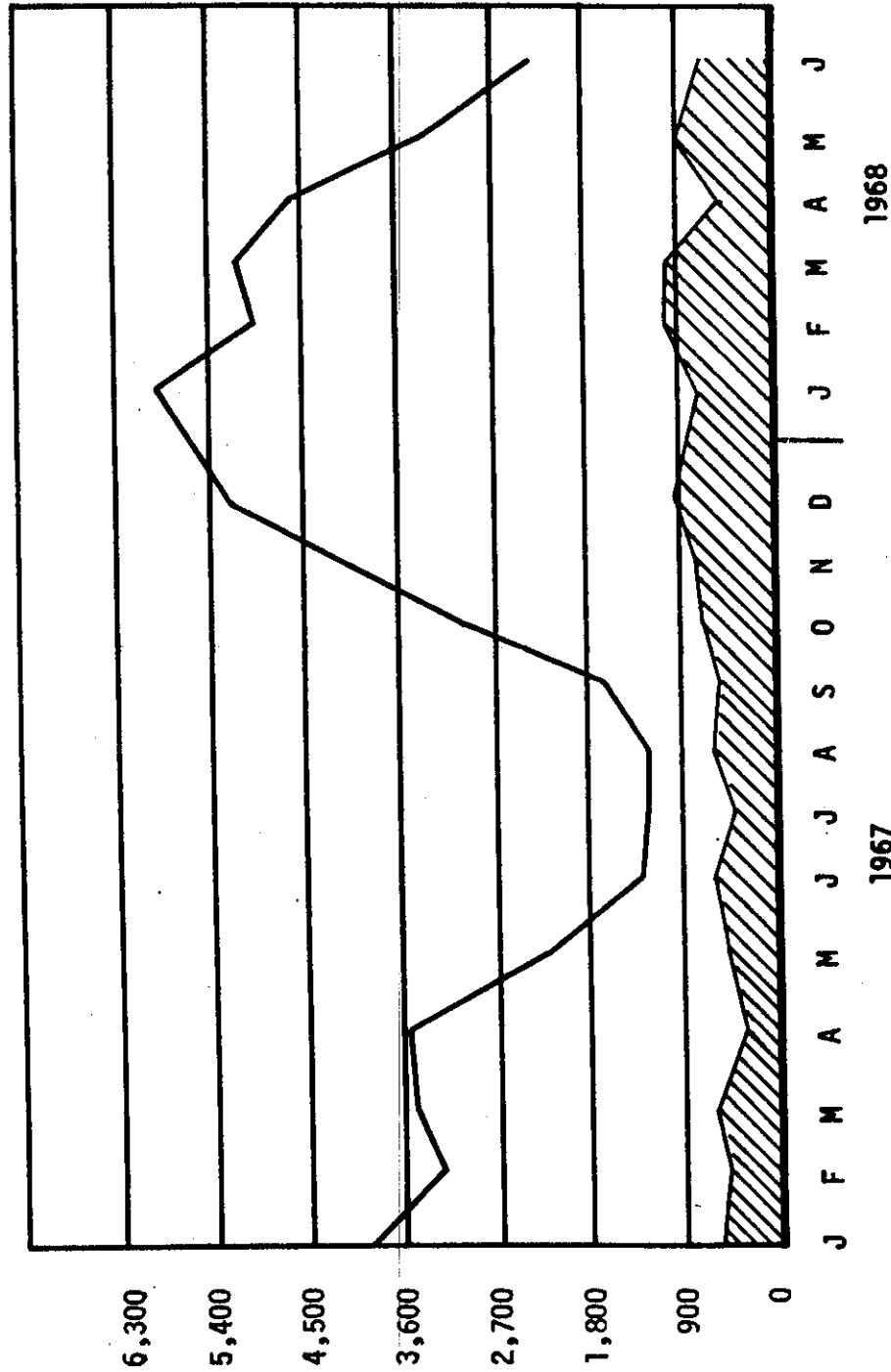


FIGURE 10

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USAF STRIKE SORTIES IN LAOS* (Excludes B-52's)



* Shaded portion emphasizes BARREL ROLL.

FIGURE 9

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CHAPTER IV
CONDUCT OF USAF OPERATIONS AND DEVELOPMENTS

The following data represent the total U.S. strike effort directed in Laos from 1 January 1967 to 30 June 1968:

	<u>1967</u>	<u>1968</u>
U.S. Navy	7,452	7,090
U.S. Marine Corps	2,614	1,019 (through May)
USAF Tac Air	34,333	26,073
B-52	1,708	1,481

A detailed breakdown of Tac Air strikes is given in Appendix I to this study. Figure 9 offers a graphic presentation of the monthly breakdown of Tac Air strikes, and Figure 10 covers B-52 strikes. A few parameters of the effectiveness of USAF attacks are provided in Appendix II.^{1/} Charts in Appendix II point out three important characteristics of the war in Laos. First, the erratic movement shown by the lines demonstrates the shifting of strike emphasis in Laos (and indirectly within the theater). This becomes especially obvious in the composite illustration, when, for example, in the spring of 1967, the emphasis on trucks, bridges, and road cuts waned, while interest in enemy structures was on the rise.

Secondly, the charts in Appendix II emphasize the seasonal character of the war. As the wet season developed during the summer months, enemy activity proportionally contracted. Similarly, USAF activity declined. As the enemy shifted emphasis elsewhere, USAF airpower followed.

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and May. A major air campaign, nicknamed TURNPIKE, was launched in April, against enemy stocks and supplies on the infiltration routes of Laos and Route Package I. To assist in this operation, COMUSMACV delegated the operational control of 30 B-52 sorties per day to the Commander, 7AF, in April.^{20/} This campaign lasted until the rainy season virtually stopped enemy activity in the area.

Developments

In the January 1967 issue of the PACAF Publication, "Southeast Asia Air Operations", the following observation was made:^{21/}

"Results of strikes that have taken place in the STEEL TIGER area have not been as gratifying as desired, though the number of sorties has increased. This area has, of a necessity, often absorbed the preponderance of the weather-forced diversions from ROLLING THUNDER targets. Continued harassment of the LOCs has been achieved along with a high level of air presence. However, attendant unavoidable contributing factors such as saturation of FACs, low fuel states after diversions, fewer validated targets, limited interdiction points, and weather have not permitted the accrual of a level of damage normally expected and desired from the sorties available."

The article continued by recommending that more validated targets were necessary in the Special Operating Area of STEEL TIGER, which at that time could be struck without FACs. This, of course, was negated by the operating rule change of March 1967, which required FAC/MSQ direction of all strikes in Laos.

Also in January, a conference was held at Udorn to discover methods of "improving capability for combating infiltration through the Laos Panhandle. Considerable attention was focused on coordinated air action against enemy

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truck movements and expanded road watch/ground reconnaissance effort".^{22/}

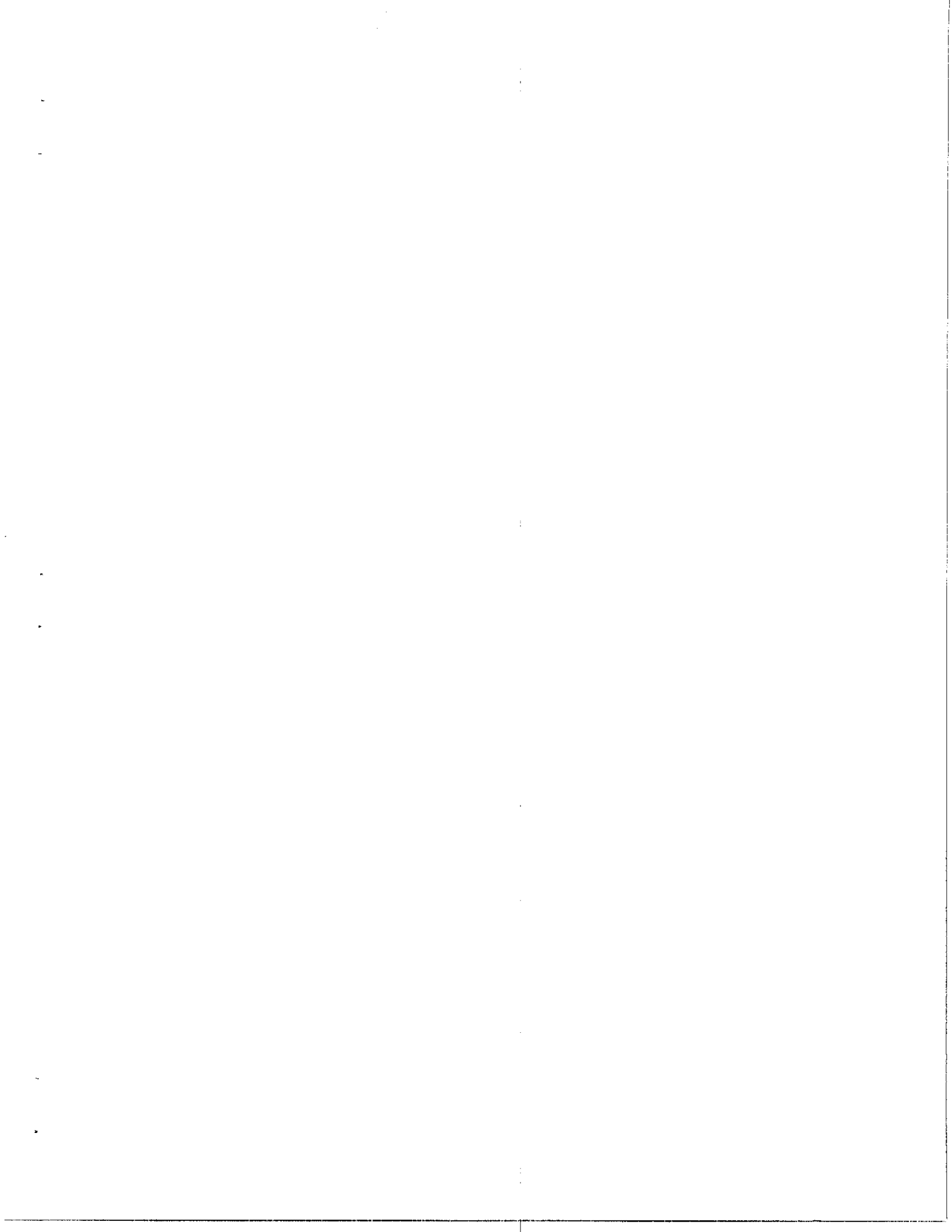
It has already been shown that enemy traffic moved along the LOCs primarily at night. Data from Appendix I indicated that, in 1967, 33 percent of the strikes in Laos were conducted at night. In the first half of 1968, 29 percent of the attacks occurred during darkness. A number of factors, however, bore upon what might seem an apparent incongruity. First, not all the Laotian effort was directed against truck traffic. Bridges, road cuts, structures, and storage areas were other targets.

Secondly, to use the maximum capability of airpower available in-theater, it was important to be able to shift strikes from one area to another. The campaign against the upper Route Packages of NVN was almost wholly a daytime effort. When NVN had bad weather, generally from October through April, there was a great advantage to be gained through the shift of these strikes to Laos, rather than have them return to their bases unexpended. In January 1967, USAF diversions from ROLLING THUNDER to STEEL TIGER amounted to about 30 percent of the total sorties for that month.^{23/}

Finally, while considerable effort was exerted to strike targets moving at night, it was patently evident that attacks against them might be more lucrative if they could be caught during daylight, immobile in their parks.

Therefore, the matter of increasing the effectiveness was, in essence, a two-fold problem. The first involved methods of employment. Techniques in applying the limited amount of air available could be revised, reinterpreted, or applied in altogether new ways. The SLAM operation was an example

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of the last method. This represented the tendency to try to weld all available assets together for heightened effectiveness. B-52s, Tac Air, FACs, ABCCC, psychological warfare, and ground teams were combined in the strike phase.

Another example occurred in March 1967. Termed the "Hub and Wheel Concept", B-52s conducted night attacks against likely choke point areas, at or near vital road intersections; this was the "Hub". Subsequently, VR/FAC aircraft worked on the "Spokes" of the wheel--those routes proceeding into or from the choke point. Hoping to find lucrative targets blocked by the strikes at the "Hub", FACs would call in Tac Air which was airborne nearby. To supplement the B-52s, C-130 or C-123 flareships were used in conjunction with A-26s and USAF T-28s to hit at night.^{24/} This was a version of the hunter-killer team concept.

But although available resources were and could be used in new forms, the key to increased effectiveness in the interdiction campaign rested in target acquisition. If targets could be found in the Laotian environment of twisting roads, bad weather, obscuring vegetation, and nighttime movement, airpower could more effectively attack them.

Target Acquisition

The three main areas of emphasis in acquisition involved FACs, RWT, and the establishment of the STEEL TIGER Task Force (SLTF), which evolved into Task Force Alpha with the MUSCLE SHOALS/IGLOO WHITE system.

In a message to COMSEVENTHFLT in February, CINCPACFLT remarked on strikes in Laos which were guided by USAF FACs:^{25/}

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"It is realized that airborne FACs provide the most effective means of coordinating interdiction against the flow of enemy war materials into SVN. Accordingly, all diverts into Laos should continue utilizing FAC control as a primary source of tgt (target) acquisition."

FACs, generally in low and slow liaison aircraft, O-1s and then O-2s, were the heart and soul of the USAF interdiction program. After visually acquiring targets and contacting the orbiting ABCCC to call in aircraft, the FACs directed the strikes. It was a rarity, however, to see trucks moving in Laos in daylight; ^{26/} they moved at night. The rugged terrain, enemy air defenses and tactics, heavy vegetation, weather, and darkness aided the enemy and were detrimental to the FAC program.

Artificial illumination was one method of assisting night target acquisition. C-130 and C-123 flare/FAC aircraft were among those used at night to find traffic and direct strikes. ^{27/} However, as soon as truck convoys became aware of the flares or aircraft presence, they stopped or even pulled off the road. ^{28/} Furthermore, as the 7AF Improvement Plan of 23 April 1968 noted: ^{29/}

"...the enemy is effectively using saturation tactics by running large convoys with trucks spaced far enough apart so that only one truck can be attacked at a time. Because of airspace required for a night strike, only one or perhaps two strikes can be conducted at a time on the convoy. Meanwhile, the other trucks evade and are lost by the FAC or strike/attack pilot."

Some improvement in the night VR program in Laos was gained by the introduction in February 1967 of the Starlight Scope. ^{30/} This aid permitted visual acquisition on bright, moonlit nights or when trucks used low headlights. After spotting the target and calling the ABCCC for aircraft, the target area was

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flared and the scope was used to direct strikes.^{31/} Fuller effectiveness of this method was hindered by the short supply of the scopes, so it was not until the 1967-68 dry season that results increased. The increase can be illustrated by comparing night data for 30 Nov - 2 Dec 1966 with the same period in 1967:^{32/}

<u>Trucks Sighted</u>	<u>30 Nov - 2 Dec 66</u>	<u>30 Nov - 2 Dec 67</u>
Visually	20	30
Starlight Scope	-	597
Destroyed	8	83

Night VR activities by an O-2 in southern TIGER HOUND were described in a 7AF Intelligence publication in June 1968 as follows:^{33/}

"Because of the mountainous terrain and the lack of TACAN equipment, visual reconnaissance altitudes along Route 110 (in the southern area of TIGER HOUND) are 6,500 feet MSL; along Route 96 (in the north) altitude for VR is 7,500 feet MSL. When the FACs are able to fix their position over a particularly lucrative choke point, virtually all visual reconnaissance and strikes are conducted between 3,000 and 5,000 feet AGL because of the many active ZPU (heavy machine-gun) and 37mm anti-aircraft guns usually present near these targets. At night with one pilot flying and the other using the Starlight Scope (light-intensifying viewing device), VR is conducted by using dead reckoning navigation to a known starting point and circling until the man with the scope picks up the road. Visual recce is then conducted by flying along the left side of the road and circling when promising areas are spotted...Flares are not normally used for VR."

FACs could then control attacks in darkness by verbally guiding strike aircraft, while viewing the target through the scope. Sometimes, they flew over the target and turned on their navigation lights to indicate the target. Either C-130 or other flareships could be used to light up the target area,

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while a FAC marked it for strike aircraft. ^{34/}

The operating rule of March 1967, which necessitated FAC/MSQ control of all strikes, did not substantially hurt night VR capability; however, it was detrimental to daytime VR. Most night strikes had already been FAC-directed. ^{35/} However, in the day, FACs were too busy controlling strikes for extensive VR. More FACs was the answer. Other airborne systems which were used were Side Looking Airborne Radar (SLAR) in Army recon aircraft, Infrared, and a Low-Light Television (LLTV). The latter was installed in two A-1s and two B-57s and test programs in Laos were carried out under the nickname, Tropic Moon, in 1968. Bad weather during these tests made the results inconclusive.

RWTs were another source of target acquisition; however, they did not operate as FACs. Their function was to report on truck traffic. Developments in this task were directed to improve their observations by moving them to more lucrative areas, and improving communications to enhance the timeliness of the intelligence which was forwarded. The reports were known as Peacock Reports.

Concern was generated in early 1967 about the overall value of the RWT concept, and steps were begun to make the reports and subsequent reactions faster. Until July, Peacock Reports were forwarded to the SLTF, an extension of the 7AF Command and Control organization which was located at Nakhon Phanom RTAFB. The SLTF offered an opinion of the RWT operation at the end of March: ^{36/}

"Peacock Reporting should be continued. We are definitely interested in any information, data collection, or system which contributes to improved truck kill rate. Discussion with CAS"

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at 7/13th meeting 25 March appeared to contribute to mutual understanding of operational limitations in responding effectively to reports. CAS representative has obtained data regarding best operational areas for Starlight Scope and attacks. Believe CAS is in process of determining possibility of relocating teams to best exploit those areas. If this action jells we should realize improved results."

Reports initiated by RWT were evaluated at Nakhon Phanom for timeliness. Those received within one hour of submission time were forwarded to the night ABCCC, Alley Cat, along with a suggested intercept point for the truck targets. If the intercept point was in an area not permissive to strike on flare operations, consideration was given to establishing a COMBAT SKYSPOT (MSQ) target in advance of the traffic, based on an average 10-km-per-hour speed of the convoys. Reports over one hour old were also evaluated and passed to the ABCCC, if they contained significant data. ^{37/}

At this time, April 1967, the Alley Cat mission was being flown by RC-47s based at Udorn. An additional radio was placed on the aircraft to facilitate direct communications with the RWT, and speed up the reports. CAS began a program to inspect and repair the RWT field radios and RWTs were positioned on the north-south axis of Delta and Echo sectors of STEEL TIGER. However, because the RC-47 could not contact all RWTs at once, an elliptical orbit was established with scheduled contact times for each team. ^{38/}

To eliminate the delays in reporting associated with the large, slow orbit of the RC-47, CAS in June 1967 proposes sending RWT reports to AIRA at Pakse or Savannakhet, and thence via relay through the 7/13th TACC at Udorn to Alley Cat. ^{39/} This was to be an interim measure, because plans were already

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being made to replace the ABCCC RC-47s with EC-130s in July. It was suggested that the RC-47s be maintained in a night mission of radio relay aircraft (RRA) between RWT and the EC-130 ABCCC, after the EC-130s replaced them. This was done in July 1967.^{40/} The language barrier was another obstacle which had to be overcome. Many of the RWT were comprised of foreign nationals. There were no Americans available with a speaking knowledge of the Laotian language. This problem was eliminated eventually by equipping the RWT with special transmitting equipment (Hark I). With this innovation, the activity observed by the RWT could be relayed electronically to the orbiting RC-47 without the need for verbal transmissions. This information was then relayed to the ABCCC. Later, a Lao-speaking Thai was placed on the EC-130 to orally interrogate the RWT about supplies and team needs.^{41/}

Additionally, coordination between 7AF and the U.S. Ambassador was maintained to more effectively position RWTs in Laos according to suspected lucrative areas and to accommodate the shifting airstrike resources.^{42/}

One of the most significant innovations which occurred in the development of U.S. airpower in Laos from 1 January 1967 to 30 June 1968 was the evolution of the MUSCLE SHOALS system, known as IGL00 WHITE after May 1968. This system was designed to use specialized aircraft, munitions, sensing devices, and related equipment to suppress and impede the enemy flow of men and supplies through Laos.^{43/}

On 6 March 1967, in response to the increasing enemy activity and to allow for the programmed increase of USAF operations in STEEL TIGER (among

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them MUSCLE SHOALS), a command and control element of 7AF was set up at Nakhon Phanom RTAFB. This element was called the STEEL TIGER Task Force, and its mission was to provide an on-the-scene agency responsible to the Directorate of Combat Operations at 7AF for decisions in the STEEL TIGER North area.^{44/}

The SLTF Commander was to "effect" operational control and supervision of 7AF forces made available for strikes in STEEL TIGER. Overall direction and control of these offensive forces remained at 7AF at Tan Son Nhut AB, RVN.^{45/} In carrying out its duties, the SLTF functioned less as an operational control agency than it did as a coordinating and analyzing extension of 7AF.

The Task Force was collocated in the 56th Air Commando Wing (ACW) TUOCC at Nakhon Phanom (NKP). It provided changes in tactics and operational guidance to forces operating from NKP. In particular, a number of directives were issued to help tactical units at NKP adjust to the increased effectiveness of the enemy air defenses in STEEL TIGER North in April 1967.^{46/} A major task which the SLTF performed was supplying 7AF with advice and near-real-time intelligence on which decisions could be based.^{47/}

In the fall of 1967, as enemy traffic began picking up once more through STEEL TIGER, the SLTF was absorbed into a new organization, Task Force Alpha (TFA). The operations order describing TFA functions stated:^{48/}

"Task Force Alpha...at Nakhon Phanom AB, Thailand is responsible to 7AF for strikes and situational analysis in the STEEL TIGER area and for special operations as directed by the Commander, 7AF. Certain daily strike, support and photo recce sorties

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will be fraggd for use by the 7th Air Force Task Force Commander. The 7AF DOCC (DCS Operations Command and Control) and ABCCC will insure close coordination with the 7AFTF (TFA) prior to diverting any of those sorties from the STEEL TIGER area."

Task Force Alpha also managed the MUSCLE SHOALS, later IGLOO WHITE, system from two facilities at NKP. These were the Infiltration Surveillance Center (ISC), which housed an automated data processing system, and the Task Force Operations Center. MUSCLE SHOALS was designed to augment the overall interdiction effort in STEEL TIGER. It consisted of an air-supported anti-personnel subsystem termed Dump Truck and an air-supported antivehicular subsystem called Mud River. As one PACAF publication outlined:^{49/}

"The concept of operations includes use of air dispensed mechanical and electrical sensors emitting signals or sounds (including voice pickup) to continuously airborne EC-121 aircraft for relay to an Infiltration Surveillance Center (ISC)...The signals are relayed to the ISC both manually and automatically. When received, the Alpha Team will analyze the sensor information and request strikes from the on-station C-130 Airborne Command Control Communications Center (ABCCC) or the 7AF TACC."

If there were a FAC available, the ABCCC followed up the report (Spotlight Report) by sending a FAC to confirm the target; and, if he could confirm the target and strike aircraft were also on hand, the FAC directed the strike.

The 7AF COA Report 68-1 of 1 July 1968, on "Air Interdiction in Laos (IGLOO WHITE Final Evaluation Report)" included data through 1 May 1968. This evaluation proposed various parameters against which the system was measured, as stated in the following section extracted from the report:^{50/}

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"IGLOO WHITE Effectiveness

"The information output of the IGLOO WHITE System in the Anti-vehicular area (Mud River) produced a general picture of truck movement that was accepted and acted upon by the Intelligence Surveillance Center (ISC) personnel who recommended strikes against specific moving truck targets and truck park areas.

"A comparison of the ISC output with visual observation from FAC aircraft has been used as a basis for judgments on the quality of this ISC output. Specifically:

"1. The general levels and distributions of truck traffic in Mud River as derived from the ISC output compares favorably with visual sightings results.

"2. The validation of the individual target recommendations by a FAC aircraft gave an average 35% confirmation rate. Actually 44 percent of the 'spotlights' passed were investigated; of these 35 percent were confirmed. There remain difficulties in relating this figure to system reliability. The validity of secondary information such as direction of movement, speed, and numbers of trucks per convoy are less well founded.

"IGLOO WHITE information was used by 7AF to (a) augment other intelligence means to develop trends and traffic patterns; (b) to aid in the identification of active truck parks; and (c) to provide immediate target information for strikes on moving trucks. Findings relative to these uses are:

"1. The general intelligence contribution of IGLOO WHITE is felt to have been valuable although this is difficult to quantify. Several examples where IW information played an identifiable and unique role can be cited.

"2. The use of IW in developing truck park targets improved throughout the season. Intensive efforts in April and May to develop truck park areas based on traffic patterns and specially emplaced sensors in park areas became the basis for B-52 targeting of the parks.

"3. A detailed analysis of the use of IGLOO WHITE in directing immediate strikes yielded the following results:

"(a) The simple approach of forwarding every detection as a 'spotlight' report and attempting to place ordinance on the indicated target DID NOT improve the truck kills.

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"(b) There was room for improving the efficiency of strike aircraft utilization. The ISC output can be used more selectively to define the more lucrative targets for air strikes; simulation results tend to show this could provide an improvement in results. Steps to use IGLOO WHITE in a fuller 'Battle Management' role started in April."

It was apparent that the transmission to the ABCCC of every Spotlight Report was not improving the reliability of the system. The system, as others, was suffering from the enemy tactics of saturation. Commenting on this overall problem and relating it to the limited airpower available, the 7AF Force Improvement Plan stated that "the frequency of sightings is increasing beyond the resources available to 7AF to strike them"^{51/}. Furthermore, as noted earlier, 44 percent of the potential targets spotted and passed by MUSCLE SHOALS/IGLOO WHITE were sought by FACs; of these 35 percent were confirmed. This amounted to about 15 percent of the total being confirmed (35 percent of 44 percent). This result did not enhance the "credibility" of the system, when it was also demonstrated that FACs could develop as many targets by themselves as were found and confirmed via the sensor system.^{52/} Therefore, beginning in April 1968, the operators of the system practiced more selectivity and, instead of passing individual sightings, passed those determined by an aggregate of indications--for example, a convoy, not a truck.

This change, as well as others which were proposed, was incorporated in the enlarged "Battle Management" concept, mentioned previously. Begun on a trial basis, this idea consisted of:^{53/}

- Rescheduling aircraft to better match expected traffic.

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- Establishing a partial ground alert on a trial basis.
(This was three A-26s on alert during the early evening.)
- Initiating an extensive road cutting program.
- Modifying procedures in TFA to better exercise the ISC output in a broader role.

While previous methods of interdiction had resulted in an estimated 10 percent kill rate of the trucks which transitted the area, it was hoped these improvements would boost the rate to 13 - 15 percent. ^{54/}

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CHAPTER V

AIRPOWER RATIONALE AND RECOMMENDATIONS

This chapter concerns three issues which provide excellent examples of the rationale revealing the manner in which the air war in Laos was waged.

These are:

- Use of propeller aircraft as opposed to jets.
- Desires of the U.S. Ambassador to Laos and Seventh Air Force responses.
- Task Force Alpha as a command and control element.

These issues offer three views of what is essentially the question of how airpower should be applied. They also demonstrate high level concern that the airpower which was available was used in the most effective manner.

Props vs Jets

On 19 December 1967, a study was sent to the JCS by the Secretary of Defense which affirmed that propeller aircraft were nine times more effective per sortie in destroying trucks and water craft. Drawn from data taken from the first nine months of 1967, the study pointed out that in that period jets destroyed or damaged 366 moving vehicles, at a rate of 1.5 per 100 sorties. The cost was established as averaging \$700,000 for each truck and water vessel damaged or destroyed.^{1/}

By contrast, prop aircraft had destroyed and damaged 996 vehicles, or demonstrated a rate of 12.8 destroyed or damaged vehicles per 100 sorties. Hence, the cost, in the case of the prop, was \$55,000 per vehicle. It was

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recognized, however, that the prop aircraft loss rate was four times higher than the jet.

It was deduced, therefore, that it would be possible to substitute two A-1 squadrons for two F-4 squadrons in Thailand "without reducing the jet sorties available for use in North Vietnam". The authors of the study estimated that this change could result in the damage or destruction of an additional 1,200 moving vehicles in Laos over a 12-month period. Proponents of this plan estimated that it could save \$28 million per year. But it was also admitted that probably an additional 18 planes and eight pilots would be lost as a result of the proposed plan.^{3/}

JCS was required to reply to the proposal by 29 December, and the question was passed for comment down the chain of command with correspondingly shortened suspense dates.^{4/} The COMUSMACV, 7AF, and PACAF replies were based on a December study by the analysis section of 7AF (DOA) contrasting the value of props as compared to jets.^{5/}

The findings were best summarized in a message from CINCPACAF to CINCPAC on 23 December 1967:^{6/}

"...from an operational standpoint, consider such a tradeoff undesirable primarily because of the reduced flexibility that this force would provide.

"...Primary effectiveness in air operations to reduce the flow of materials to SVN is achieved by striking as close to the source as possible. It is of course essential to keep the rolling stock and material that has infiltrated throughout the system under attack but whenever we have the choice, our primary emphasis must be to stop or destroy this equipment before it is

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dispersed throughout the maze and mesh of highways, roads, and trails in NVN and Laos.

"...To attack at the source requires a force that can operate in the highly defended areas of Hanoi and Haiphong at maximum strength whenever the weather permits such activity.

"...In view of the necessity to have maximum forces available to exploit all breaks in the weather, we cannot afford the luxury of highly specialized squadrons which are capable of only killing trucks in relatively undefended areas. The commander should have the flexibility inherent in his forces to employ them where they are most needed in each particular situation. The only aircraft that provides a capability of this type in NVN/Laos is the jet fighter aircraft.

"...In order to take advantage of the marginal weather which prevails over the northern areas for extensive periods, we are forced to schedule maximum efforts into these areas, realizing in advance that it is highly probable that they will divert. These diversions are planned to make up a portion of the attack forces in RP I and Laos. However, because these aircraft are weaponized for maximum effectiveness against hard targets and because they normally can only stay in Laos for short periods (15 minutes), their effectiveness against trucks is reduced. This accounts for some of the relatively poor results when these attacks are compared with the A-1 which is weaponized and scheduled for this one purpose. We accept this poor truck killing configuration in order to retain the most effective effort against the primary targets in the north and to maintain maximum presence over the LOCs in Laos. If we were willing to assign the F-4s to a truck killing role only, relative effectiveness would improve. However, with the limited jet forces available, we cannot afford this luxury.

"...There is no argument that the A-1 has been relatively more efficient in the truck killing role in Laos. However, it should be pointed out that the operations are (confined) to one small part of the overall problem. They cannot attack at the source of the supplies and cannot contribute to the second essential requirement of attacking throughout the length of the LOCs from Hanoi/Haiphong through NVN into Laos. The A-1 cannot operate even in RP I. Therefore, this secondary requirement also requires a large force of jet-propelled aircraft because of the heavy defenses in this area.

"...If we view the problem only (in) Laos, we are confronted with

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to you, as diversions from other targets, or as aborts from Vietnam strikes. Nor would it, we would expect, dispose you in any fashion against rapid response with other resources to immediate emergencies or the need for 'package strikes' when lucrative targets develop in Laos."

Particularly, the Ambassador stressed that: ^{20/}

"...it would not eliminate the need for special jet packages to be used against hard targets and troop concentrations which cannot be hit by prop driven aircraft."

Seventh Air Force opposed the "dedication" of the 56th ACW. In a number of messages in late February, the reasons for the opposition were detailed. They are summarized in the following message of 28 February from CINCPAC to JCS. CINCPAC concurred with 7AF opposition on the grounds that there were: ^{21/}

"...increased pressures from other military areas, and the limited Tac Air resources available precluded specific allocation of 'dedicated' attack sorties to Laos in the quantities desired..."

"The position...is sound and basic to the principle of effective use of air resources. The necessity for maintaining flexibility to meet the varying tasks in support of our objectives in SVN, NVN, and Laos precludes the dedication of any portion of Tac Air resources...(Flexibility was needed to permit the concentration of air)...in Laos or elsewhere when the need is critical."

"Target nominations in Laos are considered in conjunction with target nominations from other areas in the primary allocation of available strike sorties. Air attack sorties have been and will continue to be provided as necessary to meet situations in Laos."

"MUSCLE SHOALS operations require that a greater part of the sortie capability of the A-1 squadron at Nakhon Phanom be used at this time against MUSCLE SHOALS generated targets."

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Tactical air effort in addition to the A-1 assets in Laos has been provided by the increased use of the A-26s and other assets. Although additional A-1 assets will become available for use in SE Asia with the closure of an approved Program Five A-1 squadron at Pleiku in Mar 68, flexibility in the use of this squadron is necessary in order to realize the most effective employment of these assets.

"The requirement for Tac Air support in Laos is recognized and targets nominated will be given due priority. However, there are not sufficient assets available in SE Asia to permit the designation of a dedicated wing or squadron for exclusive use in Laos or elsewhere. Tac Air assets must remain flexible to ensure that they are available for use when and where most needed."

While the issue of the dedication of the 56th ACW was, in effect, closed, the problem of finding additional air support continued. The increasing deterioration of the Laotian ground situation, in particular the threats to Sites 85 and 36, continued to prompt the Ambassador to seek additional regularized air support. ^{22/}

Plans underway to increase the number of A-1s for Laotian operations and the cessation of bombing in NVN above 20° North, by Presidential order, created altered conditions for Laos. Significantly, the fact that USAF strikes were no longer sent to the northern parts of NVN eliminated a considerable number of divers which had, in the past, been sent to northern Laos.

Therefore, in May 1968, the Ambassador to Laos resumed his efforts to get more air. Now, he requested 35 strike and two flare sorties in northern Laos and 30 strike sorties in south Laos daily. He preferred propeller aircraft, but would accept jets, if they were the only kind available. At that time, 7AF provided from 35 to 39 strikes daily (not counting those associated with normal SVN infiltration strikes) to Laos. Additional sorties were sent

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to respond to Vientiane requests and emergencies. ^{23/}

In a 25 May message, 7AF commented on the Ambassador's request and the need for two additional A-1 squadrons. The contents of the message stressed that the projected increase was needed for many tasks, not only for the Ambassador: ^{24/}

"...The daily requirement of 65 sorties is considered excessive and more than can be efficiently utilized on a day-to-day basis, especially during the Southwest Monsoon. However, the requirement for support of RLG counterinsurgency operations are only part of current operations for which A-1s can be utilized and are needed. Validation of the requirement for the two additional A-1E squadrons is based on the total 7th Air Force mission requirement...."

"Current 7th Air Force support and capabilities as indicated... (35-39 sorties)...can be provided on a continuing basis as long as the bombing restriction above 20 degrees north remains in effect. If the restriction were to be lifted, adjustment would probably be required. However, some mixture of propeller and jet sorties could be provided with the mixture depending upon the availability of the additional A-1 squadrons and other factors such as enemy defenses."

On 28 May 1968, Secretary of State Dean Rusk supported the Ambassador's request for "assured" tactical air missions. It was significant to note that, while 7AF had been wary of committing additional air on a regularized basis in case bombing in the north might be resumed, the Secretary took an opposite view. ^{25/}
To the Ambassador he stated:

"...We also note your need for propeller driven act (aircraft) primarily in support of counterinsurgency operations and to be supplemented by high performance aircraft against targets for which latter are peculiarly more capable. Additional argument in favor of augmentation U.S. prop capability especially for missions in north Laos is that if there should be complete cessation of bombing of NVN, we anticipate jet assets will

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need concentrate on targets in HCM (Ho Chi Minh) Trail area. If we wish RLG to accept such concentration with its obvious political liabilities for Laos, U.S. should be prepared to satisfy RLG's own needs in northern Laos.

"Assume... (revalidation of justification for the two A-1 squadrons)... is proceeding smoothly and that recommendation will be to increase prop sorties for your needs. Please keep us informed so that we may lend appropriate support from this end as required."

On 1 June 1968, in a message to JCS, CINCPAC summarized the events which had transpired in the issue and affirmed: ^{26/}

"Forces requested... are considered adequate to fully support the stated counterinsurgency requirement. The two A-1 squadrons, four A-26 aircraft, and four C-123 aircraft would provide 7th AF with an increased capability in conjunction with jet aircraft (and) would provide the desired sortie mix to meet the requirements."

Through the remainder of the period of this report, the issue remained in abeyance. The projected increase had not been approved by the Office of the Secretary of Defense. As a result, the sortie rate for the Ambassador did not increase substantially.

TFA, Command and Control Element

As has been covered, one of the reasons the SLTF was established in March 1967, was to serve as a forerunner to TFA and the MUSCLE SHOALS operation. According to the operations order, the SLTF was to function as a command and control element which would operate with near-real-time intelligence. However, this task force did not exercise operational control over aircraft striking in STEEL TIGER. It was to "effect" operational control. While the SLTF Commander

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mention but a few of those competing for air support. Each individual or task has a responsible and well meaning sponsor, intelligently and forcefully driving for more air support in his particular area of responsibility.

"The dedication of strike forces to make MUSCLE SHOALS a self-contained operation was discussed at the outset and shelved... (the system and concept were new, with many attendant problems. A detailed analysis and evaluation followed every phase of its progression. While a final analysis was not complete)... the potential value of this system is encouraging as a supplement but certainly not as a substitute for the overall interdiction program. In my judgment, the time has not arrived to allocate strike assets to Task Force Alpha because of the need to retain centralized control of my limited air resources to meet the demands of the overall campaign and future contingencies like Khe Sanh, NEUTRALIZE, and the Tet offensive...."

This letter described plans that were well along in development to provide 7AF with automated subsystems which would offer a near-real-time command and control capability. The system would be completed before an adequate capability could be established at TFA. ^{34/}

The Commander, 7AF, also offered a clear summarization of his views: ^{35/}

"...It has long been my desire to centralize air resources, management tasking and decision-making at my Command Center. This will soon be a reality with the assistance of automated systems which will permit me and my staff to selectively monitor all air operations and the MUSCLE SHOALS activity. All necessary air, not just a dedicated force, can then be quickly switched via ABCCC to exploit lucrative targets developed by the Infiltration Center, FACs, or any other intelligence collection source. This centralized control and ability to quickly concentrate forces is not possible if the available strike force is fragmented, or if numerous control centers are used to direct operations in individual sectors of responsibility.

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CHAPTER VI
SUMMARY OF OPERATIONS

A number of observations concerning the overall operations in Laos from 1 January 1967 to 1 July 1968 are offered:

Dual Character of War

The dual character of the war was a necessary concept to grasp. That duality connotated uniqueness is understood, but in Laos, this did not mean isolation, one from the other. The air war in Laos was not always separable from the war for Laos. The primary mission of the USAF in Laos was armed reconnaissance of the enemy LOCs. However, support for Laotian military operations was also to be extended on a "recurring basis".

The frequency of support for Laos depended, primarily, on the situation of the ground war in Laos. In the 1967-68 dry season, the friendly position deteriorated. No ratio could be established between armed reconnaissance and Laotian support missions. Airpower was allocated to assist the Laotian military forces according to priority demands for support, but an inflexible standard could not be applied to measure priorities. Therefore, in essence, each request had to be measured against military and "political" benefits which could be derived.

U.S. Ambassador-Commander, 7AF, Relationship

It was important to understand the relationship between the U.S. Ambassador to Laos and the Commander, 7AF, as well as the sources from which they drew their respective responsibilities (and the limits thereon). One

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expressed needs; the other attempted to meet them within the context of available resources, priorities, and established restraints.

In general, the Ambassador formulated his needs from inputs from the RLG and CAS. He also obtained advice of the Air Attache Office in Vientiane. Accordingly, it was vital that personnel in AIRA be selected on the basis of their experience and familiarity with current tactical air operations, as well as their knowledge of more routine attache duties.

USAF-RLAF Performance

Along a similar line, it must be remembered that while the USAF sent more than 60,000 strike sorties into Laos during this period, the RLAF contributed an additional 12,000. This was about 20 percent of the USAF effort. These RLAF sorties were expended in support of ground forces. While their performance was generally good, numerous problems have been indicated. Among these were morale, leadership, coordination, communications, and a lack of flexibility.

Expanding and improving RLAF operations could increase the effectiveness of the total airpower available to support Laotian military operations. It was essential that advisors (at the AOCs) available to the Laotians should be as experienced and knowledgeable as possible in the application and coordinated uses of tactical airpower.

Improving the Air Effort

USAF airpower was employed under the basic guidelines of flexibility in theater-wide operations and centralized control. To improve the effectiveness of the air effort in meeting increasing enemy activities, more sophisticated

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and integrated methods were continually sought. SLAM and SHOCK operations were adapted to Laos to weld together complementing resources. The "Hub and Wheel" concept was another attempt. KNIGHT WATCH operations were designed to better utilize the jets diverted from northern ROLLING THUNDER. Improved Hunter-Killer procedures were implemented for nighttime operations.

Steps were taken to enhance target acquisition, especially at night. The Starlight Scope was the most effective airborne innovation along this line, but developments were made in Low-Light Television, infrared, and Side Looking Airborne Radar. Road Watch Team activities were expanded and their communications enhanced in an effort to improve the currency of their reports and scope of their operations.

The evolution from the STEEL TIGER Task Force to Task Force Alpha with the MUSCLE SHOALS/IGLOO WHITE system was also a very significant attempt to improve the target acquisition capabilities of the USAF. Operational control of strikes was withheld from the Task Force in the interest of centralized command and control and flexibility of operations.

Yet, it was interesting to note that despite attempts to automate and integrate sophisticated systems and procedures, the "rules" continued to demand that most of the targets had to be visually acquired by a FAC, who would then direct strike aircraft.

Advantages of the Enemy

The enemy exhibited increased activity in this period, both in apparently sending more supplies through Laos, and in the heightened aggressiveness of

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his ground forces in Laos. While it is true that a part of the increased number of truck sightings for the 1967-68 period could be attributed to more efficient acquisition and observation techniques, the increased activity of the enemy in Laos and SVN revealed greater demands on materiel and the enhanced ability to supply them. Many of the advantages which accrued to the enemy were matters of fortune; i.e., vegetation which obscured his movements and bad weather that plagued USAF responses.

The Communists have displayed a determination to continue their aggression and supply in and through Laos by pushing through more traffic, building by-passes, accepting their losses, and shifting their defenses. No turning point had been reached from 1 January 1967 to mid-1968 in the air war over Laos.

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APPENDIX I

USAF STRIKES IN LAOS 1 JAN 67-30 JUN 68*

<u>Date</u>	<u>Sector</u>	<u>Thailand Based</u>			<u>Vietnam Based</u>			<u>Total</u>
		<u>Day</u>	<u>Night</u>	<u>Total</u>	<u>Day</u>	<u>Night</u>	<u>Total</u>	
<u>Jan 67</u>	A	35	-	35	3	-	3	
	B	195	6	201	-	-	-	
	C	142	20	162	8	-	8	
	BR	102	7	109	-	-	-	
Total		474	33	507	11	0	11	518
	D	84	14	98	4	10	14	
	E	1,319	414	1,733	128	99	227	
	F	193	39	232	395	150	545	
	G	64	7	71	358	36	394	
	SL	14	1	15	51	12	63	
Total		1,674	475	2,149	936	307	1,243	3,392
<u>Feb 67</u>	A	102	1	103	-	-	-	
	B	113	8	121	-	-	-	
	C	99	20	119	-	-	-	
	BR	48	3	51	-	-	-	
Total		362	32	394	0	0	0	394
	D	87	27	114	-	4	4	
	E	100	562	662	50	40	90	
	F	245	52	297	316	182	498	
	G	216	25	241	642	167	809	
	SL	38	6	44	122	4	126	
Total		686	672	1,358	1,130	397	1,527	2,885

* Breakdown of data is for sectors A through G. BR and SL indicate those strikes which were placed outside the lettered sectors. Source: DOSR, Hq 7AF, 3 Jun 68; 1 Jul 68.

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<u>Date</u>	<u>Sector</u>	<u>Thailand Based</u>			<u>Vietnam Based</u>			<u>Total</u>
		<u>Day</u>	<u>Night</u>	<u>Total</u>	<u>Day</u>	<u>Night</u>	<u>Total</u>	
<u>Mar 67</u>	A	68	-	68	-	-	-	
	B	142	17	159	-	-	-	
	C	160	16	176	-	-	-	
	BR	66	6	72	-	-	-	
	Total	436	39	475	0	0	0	475
Total	D	54	17	71	-	2	2	
	E	589	489	1,078	30	172	202	
	F	156	11	167	584	222	806	
	G	36	1	37	425	87	512	
	SL	8	2	10	131	11	142	
	Total	843	520	1,363	1,170	494	1,664	3,027
	<u>Apr 67</u>	A	12	-	12	-	-	-
B		62	15	77	-	-	-	
C		117	12	129	-	-	-	
BR		23	-	23	-	-	-	
Total		214	27	241	0	0	0	241
Total	D	103	16	119	-	2	2	
	E	733	552	1,285	73	104	177	
	F	169	34	203	671	150	821	
	G	22	1	23	337	85	422	
	SL	22	2	24	204	30	234	
	Total	1,049	605	1,654	1,285	371	1,656	3,310

<u>Date</u>	<u>Sector</u>	<u>Thailand Based</u>			<u>Vietnam Based</u>			<u>Total</u>	
		<u>Day</u>	<u>Night</u>	<u>Total</u>	<u>Day</u>	<u>Night</u>	<u>Total</u>		
<u>May 67</u>	A	38	-	38	-	-	-		
	B	194	30	224	-	-	-		
	C	66	30	96	-	-	-		
	BR	10	2	12	-	-	-		
	<u>Total</u>		<u>308</u>	<u>62</u>	<u>370</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>370</u>
<u>Jun 67</u>	D	39	31	70	-	-	-		
	E	421	386	807	6	32	38		
	F	4	11	15	222	154	376		
	G	-	2	2	243	83	326		
	SL	2	-	2	191	35	226		
	<u>Total</u>		<u>466</u>	<u>430</u>	<u>896</u>	<u>662</u>	<u>304</u>	<u>966</u>	<u>1,862</u>
	<u>Jun 67</u>	A	68	10	78	-	-	-	
		B	129	30	159	2	-	2	
C		106	31	137	-	-	-		
BR		28	6	34	-	-	-		
<u>Total</u>			<u>331</u>	<u>77</u>	<u>408</u>	<u>2</u>	<u>0</u>	<u>2</u>	<u>410</u>
D		36	19	55	-	-	-		
E		191	166	357	2	7	9		
F		24	33	57	267	69	336		
G	2	22	24	99	23	122			
SL	24	-	24	22	3	25			
<u>Total</u>		<u>277</u>	<u>240</u>	<u>517</u>	<u>390</u>	<u>102</u>	<u>492</u>	<u>1,009</u>	

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<u>Date</u>	<u>Sector</u>	<u>Thailand Based</u>			<u>Vietnam Based</u>			<u>Total</u>
		<u>Day</u>	<u>Night</u>	<u>Total</u>	<u>Day</u>	<u>Night</u>	<u>Total</u>	
<u>Jul 67</u>	A	22	3	25	-	-	-	
	B	131	21	152	-	-	-	
	C	106	29	135	-	-	-	
	BR	26	2	28	-	-	-	
<u>Total</u>		285	55	340	0	0	0	340
	D	8	9	17	4	2	6	
	E	207	102	309	17	22	39	
	F	20	46	66	178	29	207	
	G	20	26	46	117	16	133	
	SL	30	4	34	48	14	62	
<u>Total</u>		285	187	472	364	83	447	919
<u>Aug 67</u>	A	29	2	31	-	-	-	
	B	213	11	224	-	-	-	
	C	109	15	124	-	-	-	
	BR	66	7	73	-	-	-	
<u>Total</u>		417	35	452	0	0	0	452
	D	6	18	24	-	4	4	
	E	153	117	270	22	50	72	
	F	10	46	56	190	64	254	
	G	-	4	4	28	6	34	
	SL	8	6	14	66	9	75	
<u>Total</u>		177	191	368	306	133	439	807

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<u>Date</u>	<u>Sector</u>	<u>Thailand Based</u>			<u>Vietnam Based</u>			<u>Total</u>
		<u>Day</u>	<u>Night</u>	<u>Total</u>	<u>Day</u>	<u>Night</u>	<u>Total</u>	
<u>Sep 67</u>	A	24	-	24	-	-	-	
	B	270	2	272	-	-	-	
	C	92	5	97	-	-	-	
	BR	22	-	22	-	-	-	
<u>Total</u>		408	7	415	0	0	0	415
<u>Total</u>	D	8	18	26	2	4	6	
	E	307	150	457	81	75	156	
	F	4	51	55	234	145	379	
	G	-	6	6	64	24	88	
	SL	24	10	34	42	13	55	
	<u>Total</u>		343	235	578	423	261	684
<u>Oct 67</u>	A	148	-	148	-	-	-	
	B	86	6	92	-	-	-	
	C	200	18	218	-	-	-	
	BR	148	2	150	4	-	4	
<u>Total</u>		582	26	608	4	0	4	612
<u>Total</u>	D	28	-	28	5	-	5	
	E	432	482	914	174	174	348	
	F	30	29	59	129	289	418	
	G	12	4	16	177	84	261	
	SL	19	12	31	116	102	218	
<u>Total</u>		521	527	1,048	601	649	1,250	2,298

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<u>Date</u>	<u>Sector</u>	<u>Thailand Based</u>			<u>Vietnam Based</u>			<u>Total</u>
		<u>Day</u>	<u>Night</u>	<u>Total</u>	<u>Day</u>	<u>Night</u>	<u>Total</u>	
Nov 67	A	131	-	131	-	-	-	
	B	144	5	149	-	-	-	
	C	311	7	318	-	-	-	
	BR	74	2	76	-	-	-	
Total		660	14	674	0	0	0	674
Total	D	18	2	20	6	-	6	
	E	610	762	1,372	402	308	710	
	F	60	68	128	179	346	525	
	G	27	11	38	265	97	362	
	SL	19	3	22	127	105	232	
	Total		734	846	1,580	979	856	1,835
<u>Dec 67</u>	A	108	1	109	-	-	-	
	B	471	19	490	-	-	-	
	C	237	11	248	-	-	-	
	BR	56	-	56	-	-	-	
Total		872	31	903	0	0	0	903
Total	D	18	1	19	-	2	2	
	E	1,102	748	1,850	380	368	748	
	F	122	81	203	139	315	454	
	G	101	17	118	206	229	435	
	SL	50	16	66	233	215	448	
	Total		1,393	863	2,256	958	1,129	2,087

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<u>Date</u>	<u>Sector</u>	<u>Thailand Based</u>			<u>Vietnam Based</u>			<u>Total</u>
		<u>Day</u>	<u>Night</u>	<u>Total</u>	<u>Day</u>	<u>Night</u>	<u>Total</u>	
<u>Jan 68</u>	A	193	22	215	-	-	-	
	B	262	15	277	-	-	-	
	C	142	31	173	-	-	-	
	BR	133	-	133	-	-	-	
<u>Total</u>		<u>730</u>	<u>68</u>	<u>798</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>798</u>
	D	64	3	67	12	-	12	
	E	878	536	1,414	258	410	668	
	F	324	199	523	942	444	1,386	
	G	65	27	92	287	189	476	
	SL	56	11	67	144	157	301	
<u>Total</u>		<u>1,387</u>	<u>776</u>	<u>2,163</u>	<u>1,643</u>	<u>1,200</u>	<u>2,843</u>	<u>5,006</u>
<u>Feb 68</u>	A	133	16	149	-	-	-	
	B	475	25	500	-	-	-	
	C	195	12	207	-	-	-	
	BR	136	3	139	-	-	-	
<u>Total</u>		<u>939</u>	<u>56</u>	<u>995</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>995</u>
	D	59	-	59	2	2	4	
	E	648	389	1,037	70	264	334	
	F	489	154	643	950	511	1,461	
	G	58	15	73	167	75	242	
	SL	86	4	90	61	47	108	
<u>Total</u>		<u>1,340</u>	<u>562</u>	<u>1,902</u>	<u>1,250</u>	<u>899</u>	<u>2,149</u>	<u>4,051</u>

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<u>Date</u>	<u>Sector</u>	<u>Thailand Based</u>			<u>Vietnam Based</u>			<u>Total</u>
		<u>Day</u>	<u>Night</u>	<u>Total</u>	<u>Day</u>	<u>Night</u>	<u>Total</u>	
Mar 68	A	36	9	45	-	-	-	
	B	280	59	339	-	-	-	
	C	162	3	165	-	-	-	
	BR	385	44	429	4	2	6	
Total		863	115	978	4	2	6	984
Total	D	20	-	20	6	1	7	
	E	605	358	963	112	264	376	
	F	501	101	602	1,005	521	1,526	
	G	53	38	91	160	70	230	
	SL	192	10	202	48	74	122	
	Total		1,371	507	1,878	1,331	930	2,261
<u>Apr 68</u>	A	-	-	-	-	-	-	
	B	2	4	6	-	-	-	
	C	8	-	8	-	-	-	
	BR	320	15	335	-	-	-	
Total		330	19	349	0	0	0	349
Total	D	33	-	33	-	-	-	
	E	977	567	1,544	144	330	474	
	F	283	224	507	247	279	526	
	G	427	30	457	174	57	231	
	SL	325	5	330	82	46	128	
	Total		2,045	826	2,871	647	712	1,359

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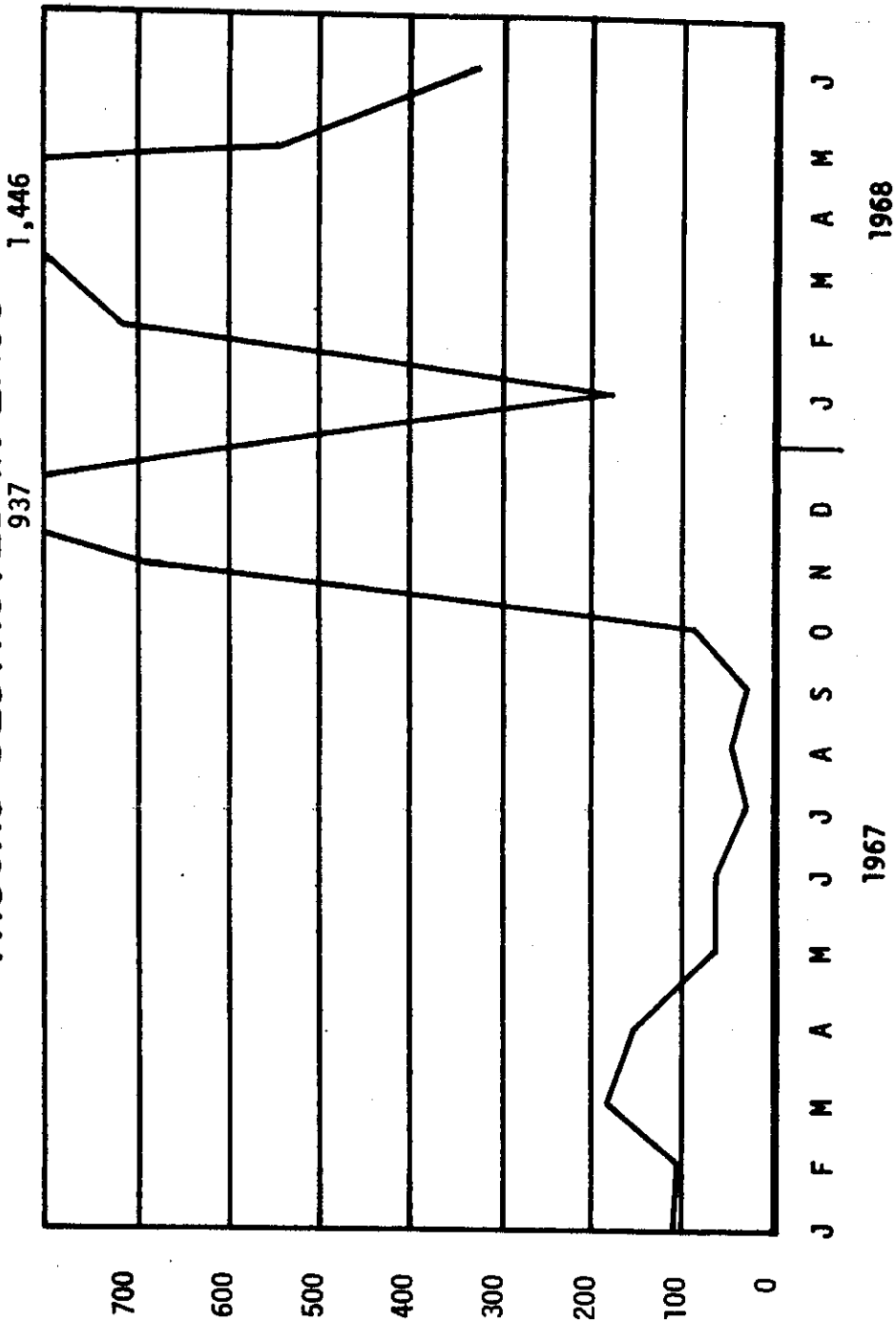
<u>Date</u>	<u>Sector</u>	<u>Thailand Based</u>			<u>Vietnam Based</u>			<u>Total</u>
		<u>Day</u>	<u>Night</u>	<u>Total</u>	<u>Day</u>	<u>Night</u>	<u>Total</u>	
<u>May 68</u>	A	-	-	-	-	-	-	
	B	71	2	73	-	-	-	
	C	195	2	197	-	-	-	
	BR	559	48	607	-	-	-	
<u>Total</u>		825	52	877	0	0	0	877
	D	34	8	42	-	-	-	
	E	466	385	851	86	201	287	
	F	224	188	412	141	238	379	
	G	64	37	101	126	48	174	
	SL	120	7	127	45	21	66	
<u>Total</u>		908	625	1,533	398	508	906	2,439
<u>Jun 68</u>	A	12	2	14	-	-	-	
	B	64	-	64	-	-	-	
	C	229	51	280	-	-	-	
	BR	256	4	260	-	-	-	
<u>Total</u>		561	57	618	0	0	0	618
	D	18	4	22	-	-	-	
	E	326	252	578	48	199	247	
	F	103	58	161	91	195	286	
	G	46	30	76	67	40	107	
	SL	62	14	76	20	14	34	
<u>Total</u>		555	358	913	226	448	674	1,587

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APPENDIX II
RESULTS OF USAF ATTACKS

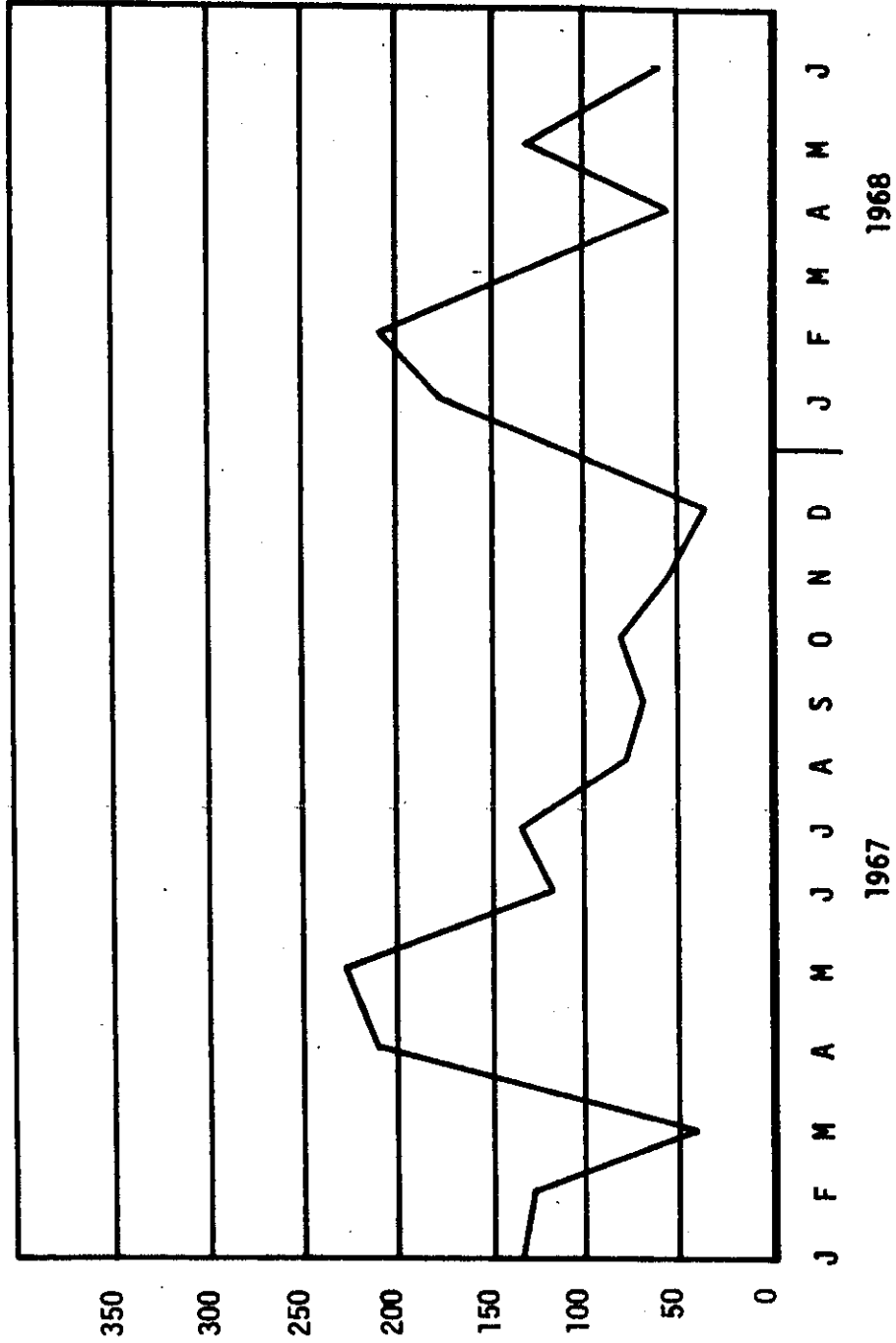
TRUCKS DESTROYED IN LAOS



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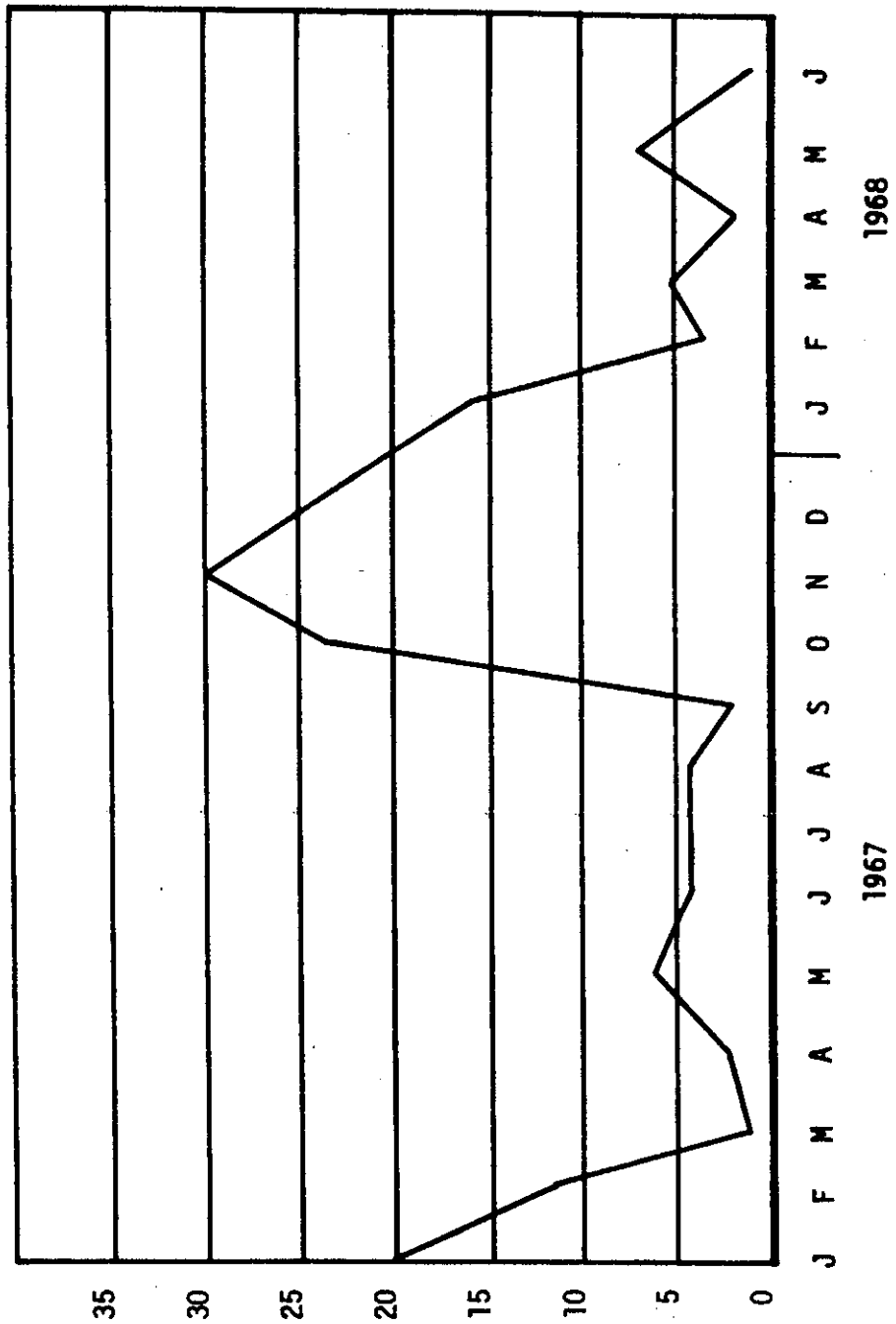
STRUCTURES DESTROYED IN LAOS



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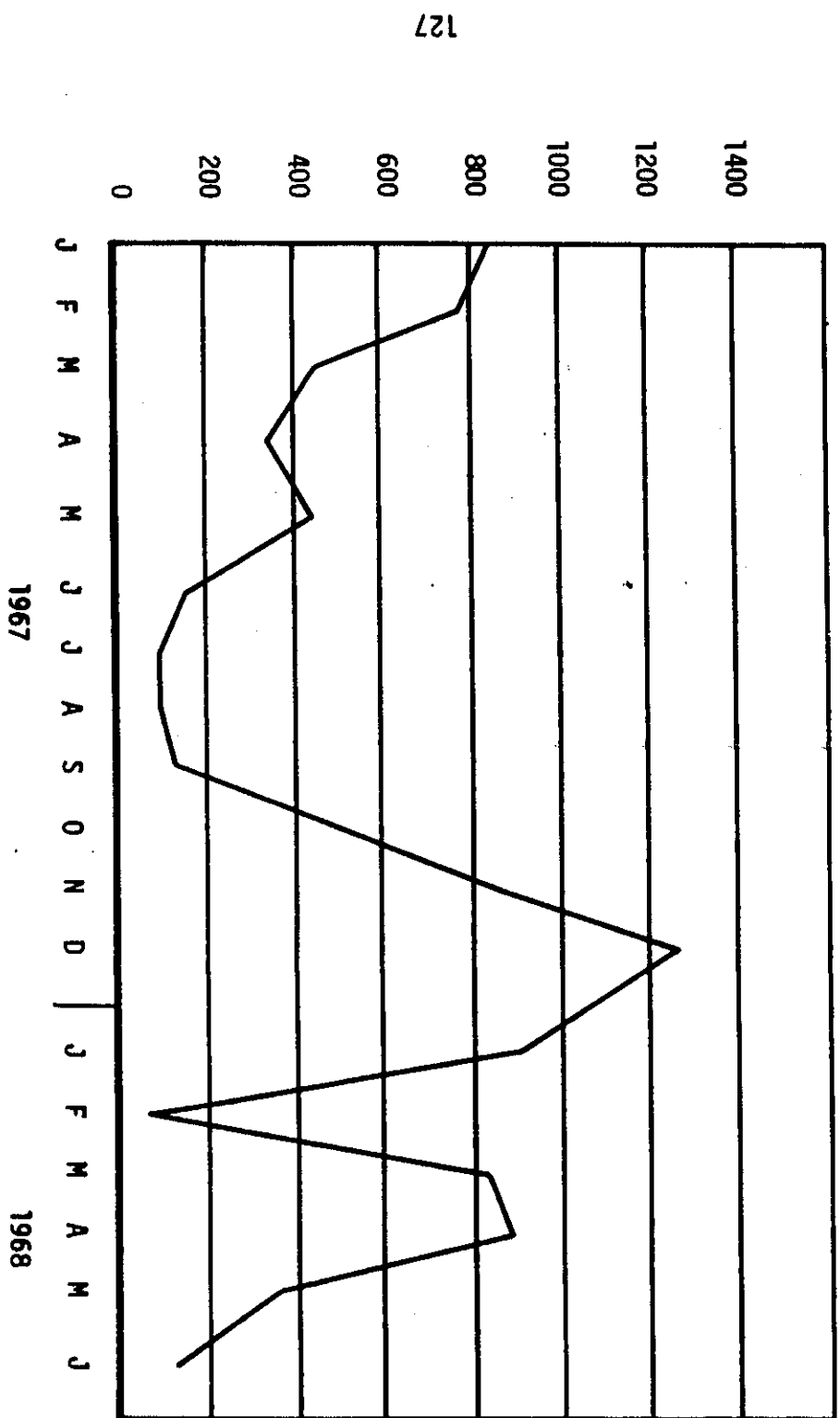
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BRIDGES DESTROYED IN LAOS



SECURITY REPORT

ROAD CUTS AND LAND SLIDES IN LAOS

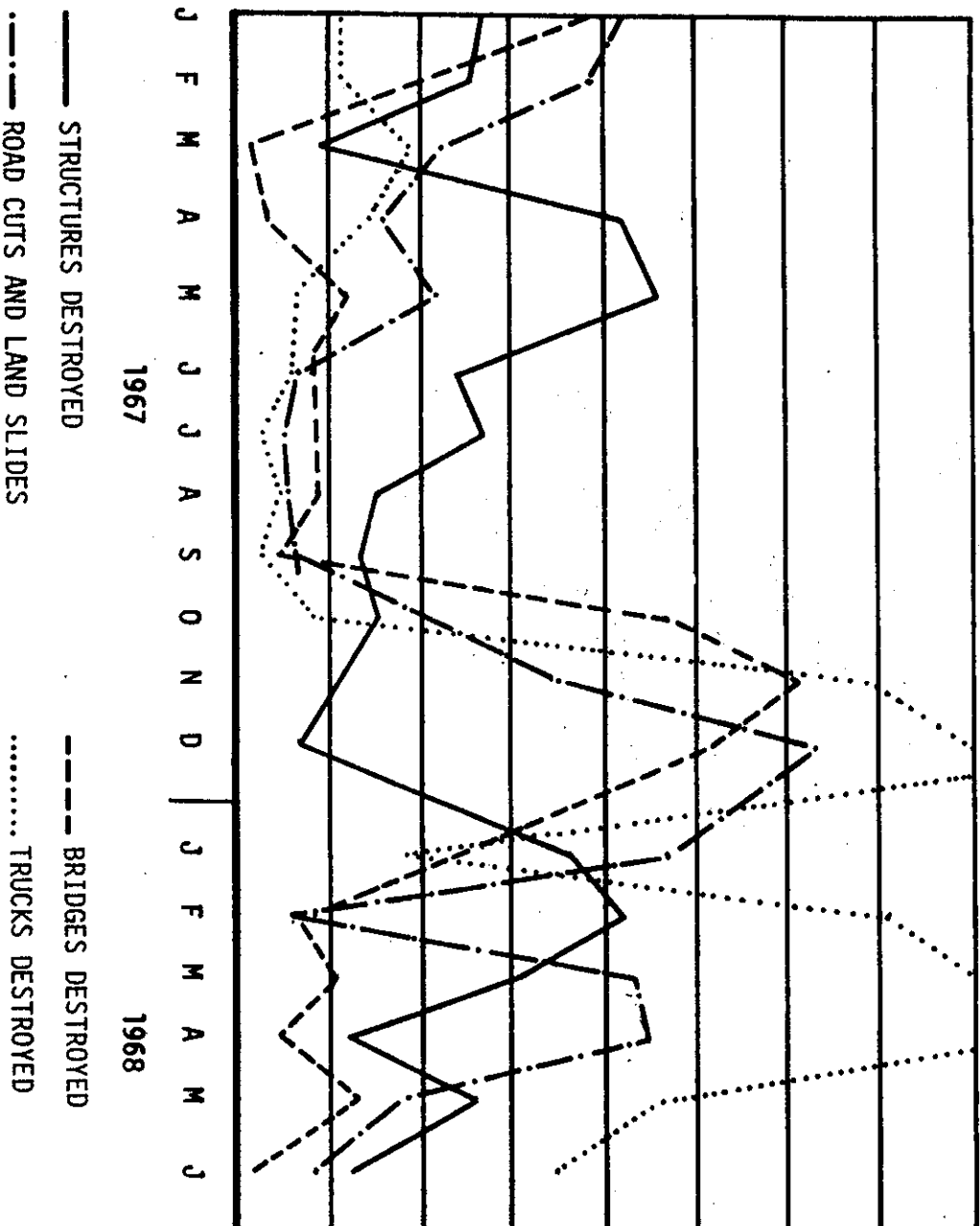


127

SECURITY REPORT

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COMPOSITE OF DESTRUCTION EFFORTS



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GLOSSARY

AA	Antiaircraft
AAA	Antiaircraft Artillery
AAIRA	American Air Attache
ABCCC	Airborne Battlefield Command and Control Center
ACW	Air Commando Wing
ADC	Auto Defense de Choc
AOC	Air Operations Center
ARMA	Army Attache
CAP	Combat Air Patrol
CINCPAC	Commander in Chief, Pacific Command
CINCPACAF	Commander in Chief, Pacific Air Forces
CINCPACFLT	Commander in Chief, Pacific Fleet
COMUSMACV	Commander, U.S. Military Assistance Command, Vietnam
CP	Command Post
CRC	Control and Reporting Center
CRP	Control and Reporting Post
DMZ	Demilitarized Zone
DOCO	Director of Operations Command and Control
FAC	Forward Air Controller
FAN	Neutral Army Forces
FAR	Forces Armees Royales
IFF/SIF	Identification Friend or Foe/Selective Identification Feature
ISC	Infiltration Surveillance Center
JCS	Joint Chiefs of Staff
LLTV	Low-Light Television
LOC	Line of Communication
LS	Lima Site
MAAG	Military Assistance Advisory Group
NKP	Nakhon Phanom
NVA	North Vietnamese Army
NVN	North Vietnam
PL	Pathet Lao

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Recon	Reconnaissance
RLAF	Royal Laotian Air Force
RLG	Royal Laotian Government
ROE	Rules of Engagement
RP	Route Package
RRA	Radio Relay Aircraft
RTAFB	Royal Thai Air Force Base
RWT	Road Watch Team
SAC	Strategic Air Command
SLAR	Side Looking Airborne Radar
SLTF	STEEL TIGER Task Force
STOL	Short Takeoff and Landing
SVN	South Vietnam
TACAN	Tactical Air Navigation
TACC	Tactical Air Control Center
TASS	Tactical Air Support Squadron
TFA	Task Force Alpha
TFS	Tactical Fighter Squadron
TUOC	Tactical Unit Operations Center
USAID	U.S. Agency for International Development
USAIRA	U.S. Air Attache
UTM	Universal Transmitter Mercator
VC	Viet Cong
VR	Visual Reconnaissance

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