PROJECT CHECO SOUTHEAST ASIA REPORT

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14. ABSTRACT

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

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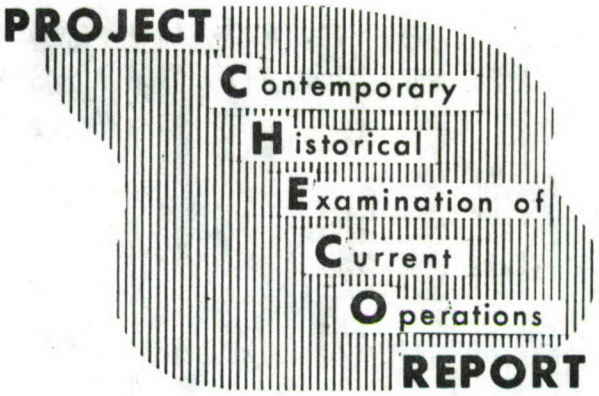

USAF SAC OPERATIONS IN SUPPORT OF SEASIA (U)

17 DECEMBER 1969

HQ PACAF

Directorate, Tactical Evaluation
CHECO Division

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Prepared by:

Mr. Warren A. Trest

Project CHECO 7th AF, DOAC

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PROJECT CHECO REPORTS

The counterinsurgency and unconventional warfare environment of Southeast Asia has resulted in the employment of USAF airpower to meet a multitude of requirements. The varied applications of airpower have involved the full spectrum of USAF aerospace vehicles, support equipment, and manpower. As a result, there has been an accumulation of operational data and experiences that, as a priority, must be collected, documented, and analyzed as to current and future impact upon USAF policies, concepts, and doctrine.

Fortunately, the value of collecting and documenting our SEA experiences was recognized at an early date. In 1962, Hq USAF directed CINCPACAF to establish an activity that would be primarily responsive to Air Staff requirements and direction, and would provide timely and analytical studies of USAF combat operations in SEA.

Project CHECO, an acronym for Contemporary Historical Examination of Current Operations, was established to meet this Air Staff requirement. Managed by Hq PACAF, with elements at Hq 7AF and 7AF/13AF, Project CHECO provides a scholarly, "on-going" historical examination, documentation, and reporting on USAF policies, concepts, and doctrine in PACOM. This CHECO report is part of the overall documentation and examination which is being accomplished. Along with the other CHECO publications, this is an authentic source for an assessment of the effectiveness of USAF airpower in PACOM.

Milton B Adams

MILTON B. ADAMS, Major General, USAF
Chief of Staff

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DEPARTMENT OF THE AIR FORCE
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FOR THE COMMANDER IN CHIEF

WARREN H. PETERSON, Colonel, USAF
Chief, CHECO Division
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FOREWORD

This report addresses two mission elements of the Strategic Air Command's 3d Air Division: B-52 operations in Southeast Asia (SEA) and KC-135 air refueling support of the Seventh Air Force's tactical strike operations. Other mission elements are examined briefly, including SIOP reflex action responsibilities in the Western Pacific, B-52 refueling support, radio relay, and ELINT operations.

SAC OPlan 52-65, which was issued in mid-1964, comprised the framework for ARC LIGHT bombing operations against selected targets in SEA with conventional bombs; OPlan 18-65 provided the outline for KC-135 refueling operations in the Western Pacific and SEA. Implementation of these plans in 1965 provides the historical point of departure for this report which treats the evolution of these operations through December 1968.

Discussion of the organization, forces involved, assigned mission, and command, control, and coordination arrangements for B-52 ARC LIGHT and KC-135 YOUNG TIGER operations are provided. Pertinent Rules of Engagement are reflected with appropriate explanations of coordination processes among SAC, MACV, 7AF, and CINCPAC, as well as the SEAITACS control responsibilities. In addressing B-52 operations, emphasis is also given to sortie rates, types and amounts of munitions/ordnance employed, numbers of aircraft and aircrews involved, and factual evaluation of their effectiveness. Evaluation is limited to documented evidence found in official reports and related material, including written and oral comments by military leaders involved in SEA operations.

Lt. Gen. Alvan C. Gillem, II, Commander, 3d Air Division, at the time this report was written, previously was Strategic Air Command's Deputy Chief of Staff, Operations. He experienced with SAC the steady expansion of B-52 and KC-135 operations in the SEA conflict. As 3d Air Division's Commander, his prime concern was to assure, within the guidelines directed by SAC, optimum utilization of the forces under his command--both in response to the Southeast Asia mission and SIOP requirements in the Pacific Command area.

CHAPTER I

ARC LIGHT OPERATIONS

"You will recall that we went to the 1,800 sortie rate at a time when SAC forces in the Western Pacific had been augmented on an emergency basis because of the Pueblo Incident. At that time, the threat to Khe Sanh developed and was repulsed. Subsequent threats to Dak To and Saigon resulted in a continuation of the maximum effort 1,800 rate attained for Khe Sanh." 1/

Gen. Bruce K. Holloway, USAF

Organization and Mission

The history of the 3d Air Division's force posture between 1965-1968 was one of constant change, resulting primarily from the expanding operational role its B-52 and KC-135 forces were required to perform in SEA. While the mission of the ARC LIGHT force remained basically the same, i.e., to put the bombs on assigned targets according to schedule, certain changes were effected in operational concepts and procedures to make the force more responsive to requirements of the Commander, U.S. Military Assistance Command, Vietnam (COMUSMACV). Also, operational characteristics changed in that the B-52s, becoming more closely tied to specific ground situations, were being used in an interdiction and close support bombing role, whereas they were initially employed in SEA against only fluid targets of a suspect nature. 2/

Organizational changes were constantly effected and were a direct result of the management requirements associated with postural growth. The 3d Air Division Commander and his key staff were on tour assignments; however, aircraft and crews were provided on a rotational basis from CONUS units. When the

Division entered the peak period of 1,800 ARC LIGHT sorties, management of the expanded force posture was provided through three wings--one each at Andersen, U-Tapao and Kadena. Andersen was a SAC base; however U-Tapao, and Kadena were Pacific Air Forces (PACAF) bases and were provided base support through PACAF resources.[3/]

Command, Control, and Coordination

Command, control, and coordination procedures for the ARC LIGHT force were unique to the SEA conflict and were developed parallel with the unique role the B-52s were performing in SEA bombing operations. In the ARC LIGHT bombing effort, the B-52s were being utilized in a role far different from their original intent. They were being employed in a role normally reserved for tactical fighters, whereas they had been designed for strategic operations and, prior to their use in SEA, had been primarily oriented toward nuclear alert operations.[4/]

While the ARC LIGHT force was an integral part of COMUSMACV's concept for prosecuting combat operations in SEA, SAC's foremost responsibility was the Single Integrated Operations Plan (SIOP) mission. ARC LIGHT operations were temporary in nature, their tenure directly dependent upon developments in the SEA conflict, and were at variance with established Air Force doctrine. Since SEA B-52 operations were but one part of SAC's global responsibilities, which greatly impacted on the overall management of SAC resources, it naturally followed that the ARC LIGHT force would remain within established command channels, i.e., JCS and SAC.[5/]

Once sortie levels and force concepts were approved by JCS, COMUSMACV

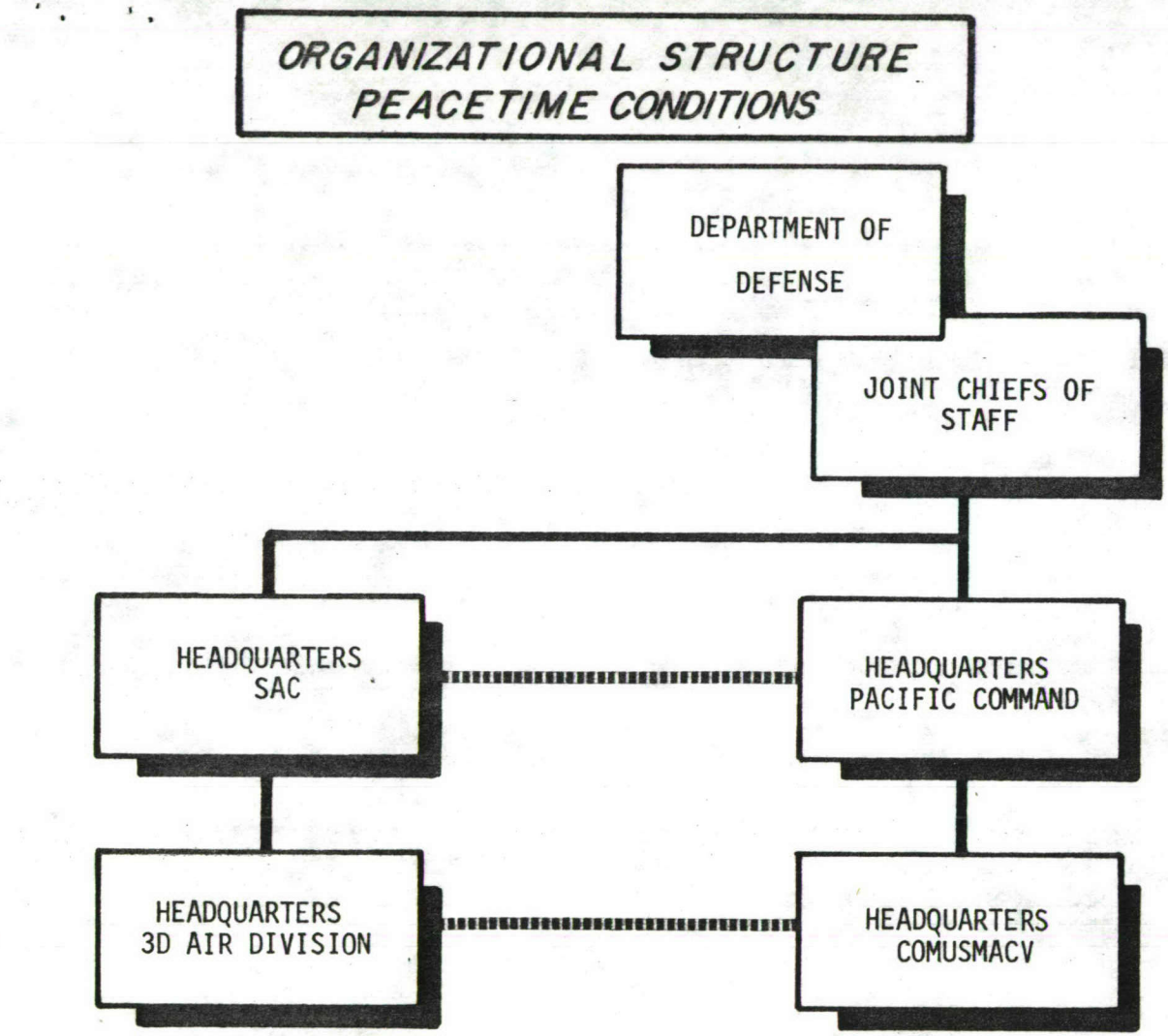

ORGANIZATIONAL STRUCTURE
PEACETIME CONDITIONS
DEPARTMENT OF DEFENSE
JOINT CHIEFS OF STAFF
HEADQUARTERS SAC
HEADQUARTERS PACIFIC COMMAND
HEADQUARTERS 3D AIR DIVISION
HEADQUARTERS COMUSMACV
Legend
Direct Chain of Command
Coordinating Chain of Command

FIGURE 1

coordinated directly with SAC on matters concerning day-to-day operations. COMUSMACV's responsibility with regard to ARC LIGHT strikes centered around the selection of targets and tasking the force against these targets in line with JCS-approved sortie levels and SAC planning factors. Targeting procedures, which were continuously improved with experience gained over the three-year period of operations, was an orderly flow ending with the daily selection of targets by COMUSMACV and then passed on a scheduled basis through the SAC Advanced Echelon (ADVON) to the 3d Air Division. (Fig. 2.)[6/]

In mid-1968, COMUSMACV's stated mission of the ARC LIGHT program was: "to assist in the defeat of the enemy through maximum destruction, disruption, and harassment of major control centers, supply storage facilities, logistic systems, enemy troops, and lines of communications in selected target areas." Target identification and selection in each of the corps areas was a continual process at 7AF and Hq MACV targeting elements. Targets developed in field and headquarters targeting elements were reviewed and selected according to priority at each level and nominated to the J-2 and Director, Combat Operations Center (COC), Hq MACV, for selection according to overall priorities.[7/]

ARC LIGHT targets in South Vietnam were nominated for strike to MACV by the 3d Marine Amphibious Force (III MAF) for I Corps, 1st Field Force Vietnam (I FFV) for II Corps, 2d Field Force Vietnam (II FFV) for III Corps, and the Senior Advisor for IV Corps for their areas of responsibility. Headquarters, 7AF, normally nominated targets for strikes in Laos and North Vietnam. Certain MACV agencies, i.e., Combined Intelligence Center, Vietnam (CICV), Special Operations Group (SOG), Special Targets Section, etc., also nominated targets

both in-country and out-country when all source intelligence indicated a lucrative ARC LIGHT type target had developed or was developing, or when operational considerations or planned operations dictated. All targets were thoroughly analyzed and screened by the nominating agencies with in-country targets cleared by ARVN and U.S. units for strike prior to submission to MACV. Laos target concurrence was obtained by Hq MACV from the U.S. Ambassador, Vientiane.[8/]

Target nominations were submitted twice daily to MACV by the nominating units. As these nominations were received, the location and supporting intelligence were passed to the Special Targets Section, J-2, for evaluation and the establishment of recommended priorities. The J-2 and Director, Combat Operations Center (COC), Hq MACV, jointly reviewed target nominations twice daily. The highest priority targets were recommended once daily to COMUSMACV who personally reviewed and approved ARC LIGHT missions.[9/]

SAC was represented in the forward area by SAC ADVON, which was collocated with 7AF headquarters at Tan Son Nhut AB, RVN. This activity, which was organized in Vietnam in early January 1967, provided B-52 planning expertise in the forward area.[10/] Prior to the ADVON being established, SAC maintained a liaison office at Tan Son Nhut. The Strategic Air Command Liaison Office (SACLO) was activated by Headquarters, SAC, on 24 March 1965, for the primary purpose of coordinating SAC tanker support to 7AF fighters.[11/]

SACLO responded to higher headquarters' requests through the Commander, 3d Air Division, and responsibilities included:[12/]

. Establish a working relationship with the Commander, 2d Air Division (later 7AF).

TARGET PROCESSING

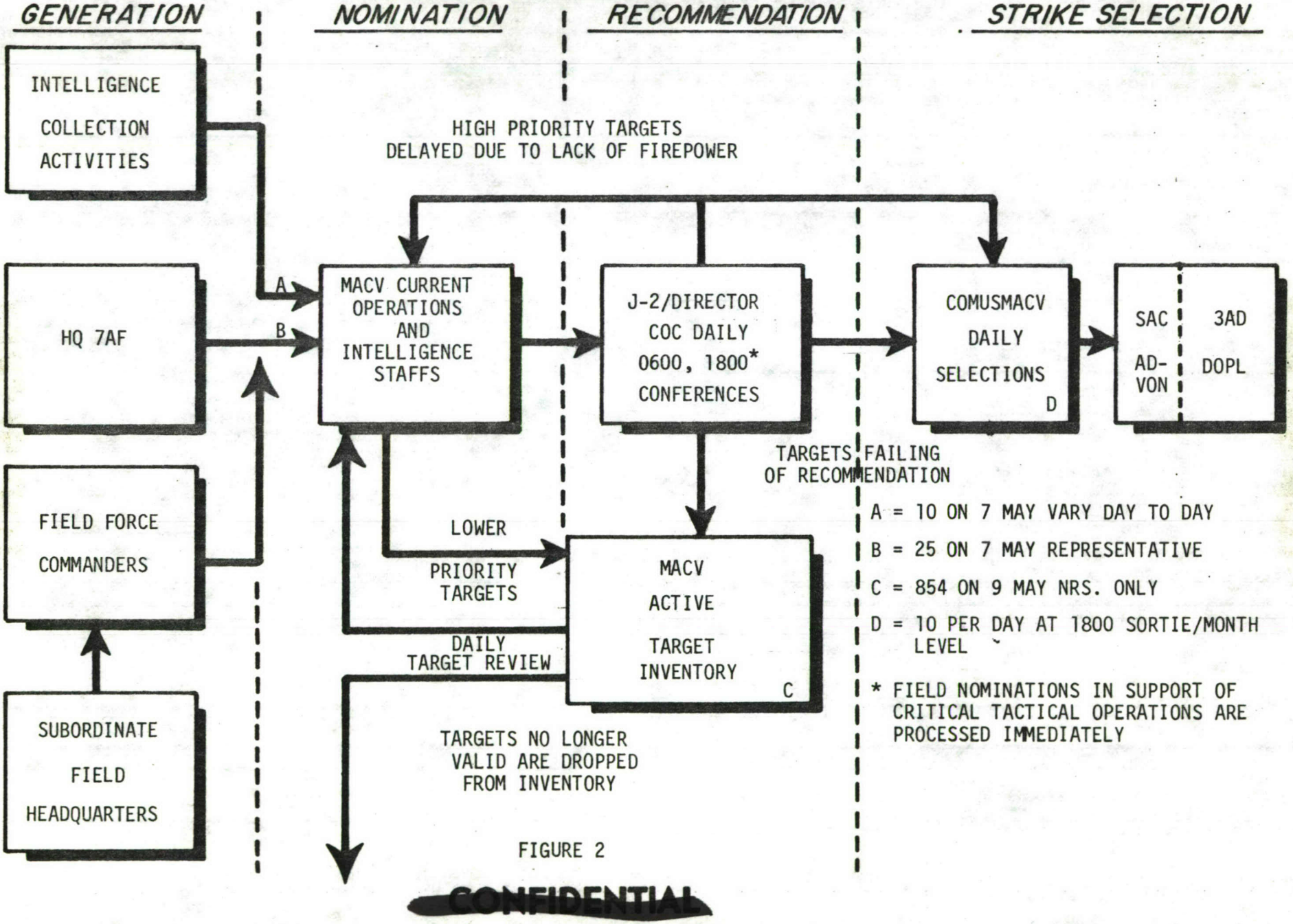


FIGURE 2

. Coordinate administrative and operational matters of mutual concern to both commands and keep the Commander, 3d Air Division, advised.

. Act as the single source of information on SAC operational activities in Southeast Asia and advise Commander, 2d Air Division, of such activity when it pertained to 2d Air Division.

. Coordinate forward area refueling requirements and provide the Commander, 2AD, and his staff, technical information and assistance to assure the most effective use of SAC resources.

. Assist in development, execution, and monitoring of various SAC operations directed by this headquarters or by other proper authority.

. Evaluate and recommend to Headquarters, 3AD, methods for improving tanker mission response time, capability, and effectiveness.

. Assist the Commander, 2AD, and his staff, as necessary, to insure successful support of his mission.

The SAC Advanced Echelon (ADVON) evolved from the requirement for improved coordination and planning associated with the greatly expanded ARC LIGHT activity. Coupled with the elevated level of activity, the introduction of a ground directed bombing capability made it possible to react much faster than before, and in turn, required that much of the mission planning be accomplished in the forward area.[13/]

As the name implied, SAC ADVON was a forward extension of SAC Headquarters to provide COMUSMACV, through the COMUSMACV Deputy for Air, bombing and tanker expertise. Where SACLO had been assigned to the 3AD, the ADVON was assigned to Headquarters, SAC, and provided direct coordination for SAC and 3AD with 7AF and MACV.[14/] Although assigned to SAC and with a direct administrative line to the

SAC DCS/O, SAC ADVON's day-to-day activities were almost exclusively with the Commander, 3d Air Division.[15/]

In April 1968, arrangements were made for SAC ADVON to be represented at the MACV Target Selection Committee meetings in an advisory capacity. Previously, a SAC representative had not been present at these meetings, and targets were selected by ground force commanders without the benefit of firsthand knowledge of B-52 capabilities, etc. Col. K. E. Wehrman, SAC ADVON Commander, commented on this limitation:[16/]

> *"Previously, there were occasions when the target would be passed to 3AD and SAC ADVON only to find that certain factors precluded an ARC LIGHT strike as outlined by MACV. The target would have to be returned to MACV for reorientation, and valuable time was wasted. Now we sit in on the meetings, monitor the target selection and advise them whether we can strike the target as desired, or whether it needs to be reoriented, whether we can hit it at all, and what support we require to make the strike."*

After five targets were selected twice daily by MACV, they were passed by secure phone to SAC ADVON. SAC ADVON planners examined the target selections closely to insure their compatibility with B-52 procedures. They also examined the targets from the standpoint of which force--U-Tapao, Kadena, or Andersen--should be used to strike specific targets. Location of the target in a possible threat area was considered. If it were decided that protective support was required from 7AF, this was conveyed to 7AF orally and then in writing. 7AF was responsible for providing TINY TIM support, i.e., EB-66, ECM, F-105 IRON HAND and MIG CAP.[17/]

After completing their examination of the targets, SAC ADVON officers then

passed the pertinent target information and TOTs to 3d Air Division DOPL. This was detailed information, which included basic intelligence on the targets received from MACV sources. SAC ADVON also made certain recommendations regarding tactics, axis of attack, etc.; however, final authority on such matters rested with the 3d Air Division. Colonel Wehrman explained:[18/]

> *"The 3d Air Division is responsible for all operational aspects of the ARC LIGHT missions, including tactics and forces to be used. We strictly make recommendations. The Division takes all information that is passed, completes the planning, and writes the frags. They determine the force that will fly the mission and they execute the mission."*

Colonel Wehrman also noted that since the time he assumed command of the ADVON in mid-1968, MSQ sites were directing between 80 and 85 percent of all strikes to the target. Thus, coordination between ADVON and the SAC office at Tan Son Nhut which were responsible for MSQ operations was imperative. Each day, the MSQ officials were contacted as soon as the ADVON received the targets from MACV, and they daily reviewed all targets and data which were pertinent to their operation. SAC ADVON also coordinated closely with the 7AF Tactical Air Control Center (TACC), to insure that they were fully advised regarding daily ARC LIGHT activity. Close coordination was essential in view of related operational planning by the TACC and associated airspace control responsibility of the 7AF Tactical Air Control System (TACS).[19/]

Daily preplanned targets were passed by SAC ADVON via secure telephone to 3d Air Division planners 24 hours in advance of the first time over target (TOT). Message confirmation followed. Time required by the 3d Air Division for planning and review varied according to the base from which forces would be launched.

Maximum 3d Air Division time for Andersen forces was seven hours, eight hours for Kadena forces, and ten hours for U-Tapao forces. Time required for unit planning and mission briefings also varied slightly at each base. (Fig. 3.)[20/]

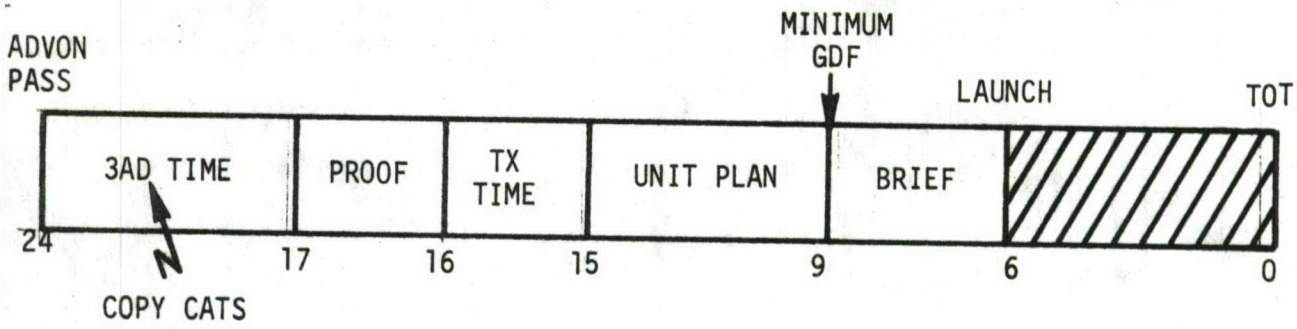
Time at 3d Air Division was involved in addressing bombing tactics, axis of attack, and detailed mission planning to include routing (common entry points/ common exits), air refueling requirements, and deployment/redeployment schedule. Warning orders were dispatched to the units concerned and command review/approval was accomplished from 0830 to 1700 hours daily. The division published the frag for each specific ARC LIGHT strike and followed this with a mission execution directive.[21/]

Resume of Operations

The history of the ARC LIGHT program records a continuing effort by SAC to make operations more responsive to COMUSMACV requirements. Along with the improved force posture and the elevated sortie levels, tactics were under constant improvement to enhance flexibility and responsiveness of the force. In the early months of the ARC LIGHT program, the B-52 force adhered strictly to targets that were preplanned 24 hours in advance. The fluid ground situation in SEA coupled with the enemy's compromising of the targets to be struck, made early program effectiveness highly questionable.[22/]

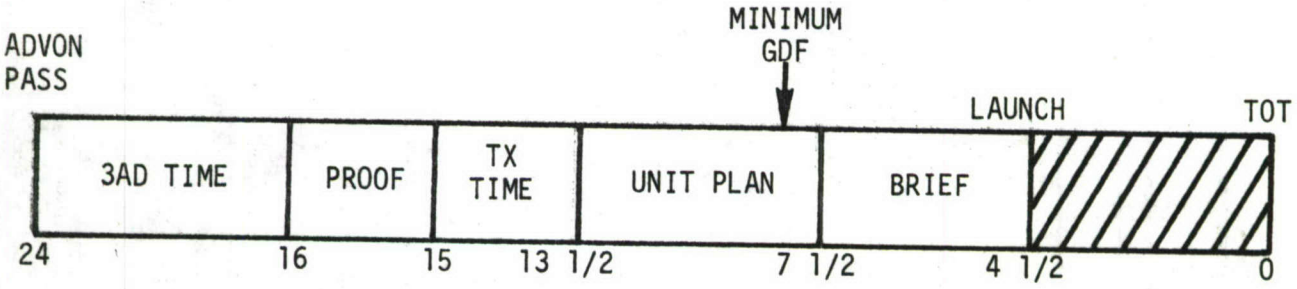
In that early environment, the division had only the forces on Guam, and six hours were required to fly from Guam to the target. One of the first steps taken toward improving responsiveness was the Quick Reaction Force (QRF) concept--B-52s and KC-135s on a standby alert status. When COMBAT SKYSPOT tactics were

ANDERSEN FLOW - LATEST POSSIBLE TIMES



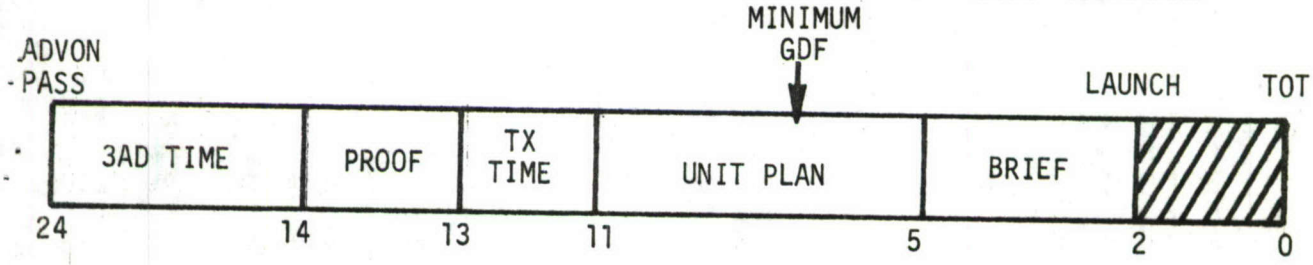
MAXIMUM 3AD TIME = 7 HOURS

KADENA FLOW - LATEST POSSIBLE TIMES



MAXIMUM 3AD TIME = 8 HOURS

U-TAPAO FLOW - LATEST POSSIBLE TIMES



MAXIMUM 3AD TIME = 10 HOURS

FIGURE 3

SOURCE: 3AD (DOPL)
March 1969

used, the QRF was capable of reacting within a minimum of nine hours prior to TOT; when Synchronous tactics using briefed offset aiming points were required, the QRF was capable of reacting within a minimum of 12 hours prior to TOT.[23/]

While COMUSMACV utilized the QRF substantially, SAC planners recognized that an even faster reaction capability was needed. To achieve this, they devised the Inflight Diverted Force (IDF) concept--a force which was diverted to a target of immediate priority while en route to the assigned target. This concept had its limitations. One SAC planner explained:[24/]

> *"We were reluctant to give COMUSMACV control of an entire mission because we were launching as high as twelve or even thirty aircraft missions. It was also felt that the decision to divert would be made in too hasty an environment. It was decided to allow MACV only to divert what was known as the Inflight Diverted Cell (IDC), three aircraft to the cell. This was not used very much because MACV did not have time to clear the targets. It took them too long to obtain clearance from the Province Chief, so MACV was right back where it started--with the 12-hour QRF."*

Other types of missions included the Ground Diverted Force (GDF), which was a force scheduled for a preplanned strike that was diverted to a target of higher priority before launch, and the Inflight Diverted Mission (IDM), which was a force destined for a strike requiring flight within a possible SAM environment, and which was capable of diverting to a preplanned alternate or secondary target.[25/]

Movement of a force into U-Tapao was also designed to improve responsiveness in that the force was much closer to the target area. However, early operations were hindered by political restrictions which precluded B-52 overflights of Laos, and the missions were required to fly south around Cambodia

and in through the southern tip of South Vietnam to the target. After this restriction was removed, flight crews still were faced with a minor problem of pacing due to the short time to TOT.[26/]

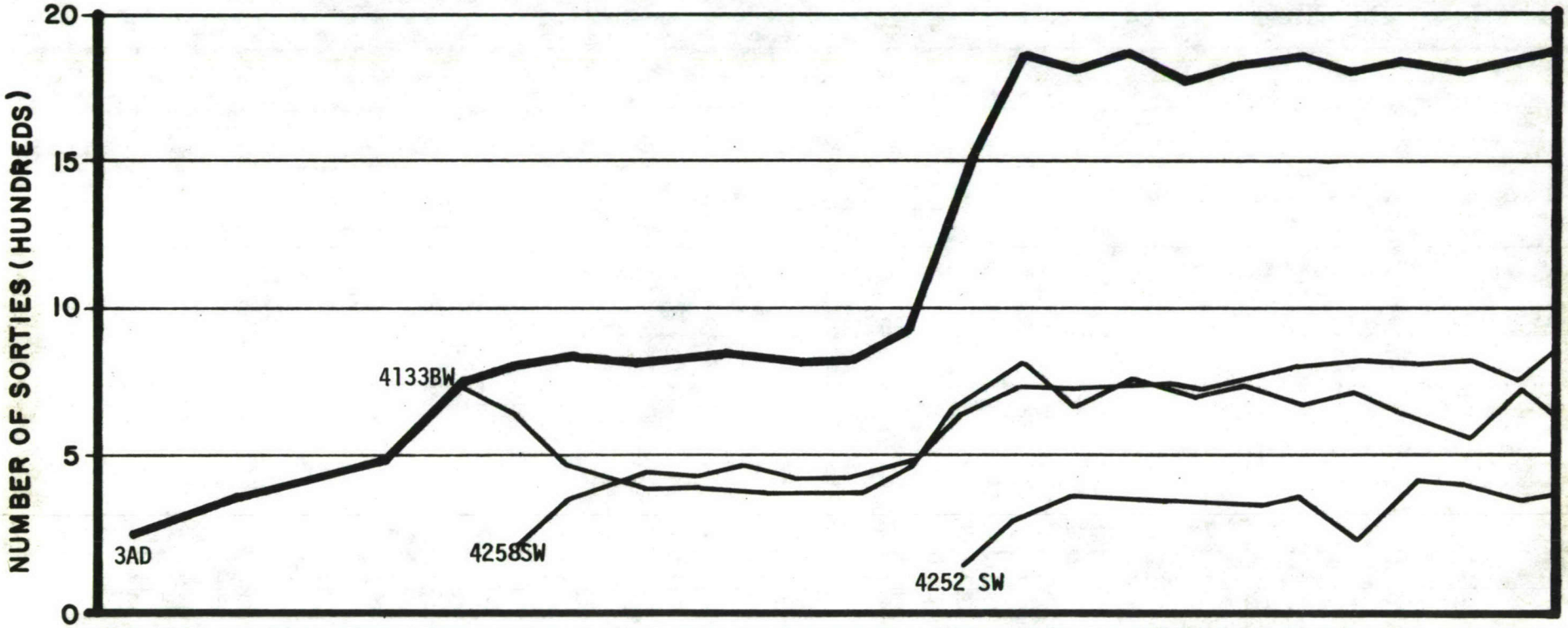
The Question of Sortie Rate

As stated earlier in General Holloway's quotation, in response to the Pueblo Incident in January 1968, SAC augmented its Western Pacific force by deploying additional B-52s to Okinawa--for strikes against North Korea, if and when directed by the JCS. While subsequent developments in the Korean situation did not result in strikes against North Korea, these forces were used to augment the ARC LIGHT program in SEA. They also provided the means for a substantial rise in the JCS-allocated ARC LIGHT sortie rate to 1,800 sorties per month, which was in sharp contrast to the number of B-52 sorties flown monthly in the early days of the ARC LIGHT program.[27/]

From one B-52 mission flown in June 1965, the early ARC LIGHT program grew to 39 missions in December 1965, when 306 sorties expended 5,368 tons of bombs.[28/] As reflected in annual sortie statistics, ARC LIGHT operations grew steadily year by year: more than 440 sorties were flown monthly in 1966, more than 820 monthly in 1967, and more than 1,730 monthly in 1968.[29/] (Fig. 4.) In total operations from June 1965 through December 1968, the B-52s flew more than 37,550 sorties in the ARC LIGHT program. By November 1968, they had dropped more than 886,490 tons of conventional ordnance.[30/]

Conceding that there was "little doubt that the 1,800 sortie rate has been highly effective," General Holloway urged that "some means of achieving similar

3D AIR DIVISION MONTHLY SORTIES FLOWN – B-52



	1st	2D	3D	4th	1st	2D	3D	4th	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
4133 BW	218	309	378	411	445	542	761	652	463	402	400	391	379	371	463	697	811	673	752	708	743	685	733	618	565	745
4258 SW								179	392	435	445	472	442	444	463	652	749	738	750	710	753	808	844	825	827	752
4252 SW																126	317	393	377	359	340	373	235	435	420	374
3 ADIV	218	309	378	411	445	542	761	831	855	837	845	863	821	815	926	1475	1877	1804	1879	1777	1836	1866	1812	1878	1812	1871
	MONTHLY AVERAGE								FISCAL YEAR 1968												FISCAL YEAR 1969					
	QTR/FY 66				QTR/FY 67																					

FIGURE 4

effectiveness but at a lower sortie rate" be determined. The SAC Commander-in-Chief noted that SAC had been "severely extended" at the 1,800 monthly sortie rate, and the "situation worsens with time." Noting that the threats which had prompted the increased sorties had been resolved and "the anticipated large scale offensive in SVN has not materialized," General Holloway reasoned that a reduction in the ARC LIGHT program was in order. As for the B-52 role in the interdiction program, he noted that according to a 14 September 1968 MACV estimate, infiltration had declined from a monthly average of 23,000 personnel from January through August to 12,000 in September with a projection of less than 8,000 in October.[31/]

General Holloway proposed a tactic wherein effectiveness could be maintained, while reducing the sortie rate:[32/]

> *"Reports of numbers killed and materiel and structures destroyed by SAC attacks continue to be modest; however, they often emphasize the shock of psychological effect of the B-52 bombing. We presently attack ten 2 x 1 KM target boxes a day with six aircraft per box. If we were to reduce the number of aircraft per box from six to four we would reduce the area coverage only from 28 percent to 20 percent. Were we to lengthen the bomb train from the present 5,000 feet to 8,000 feet and use 4 aircraft against a 3 x 1 KM box we would eliminate the present 38 percent bomb overlap in each train and achieve the same total area coverage we realize today. I believe that such a tactic might provide the same amount of shock and psychological effect with only a slight decrease in numbers killed and damage inflicted."*

In proposing this tactic, the Commander-in-Chief, Strategic Air Command (CINCSAC), made it "abundantly clear" that the reason for the proposed change was "our imperative need to save resources with which to maintain the nuclear

deterrent forces at the minimum acceptable level." He cautioned: "The proposed tactics should not be used to increase the number of targets being struck each day. We could not now, for example, give MACV 15 four aircraft missions per day because the additional resources that would be required for planning, briefing, launching, recovering, debriefing, etc. would reduce even further the effectiveness of the nuclear deterrent force."[33/]

The reduction proposed by SAC would lower the sortie rate to 1,200 per month. This reduction would yield significant savings in crews, manpower, and costs. B-52 crew requirements for the SIOP could be supported with a prediction of only random degrades. In-theater personnel would be reduced by approximately 2,500. This would allow the return of some 800 PCS authorizations to the Air Force. Cost savings in munitions, SAC O&M, POL, depot maintenance, and manpower would amount to about $155.6 million per six-month period. Should the SEA situation require a surge of ARC LIGHT forces, CINCSAC noted that the sortie rate of 1,800 could be renewed within 7-10 days if required.[34/]

When asked his views on the proposed reduction, Gen. George S. Brown, Commander, 7AF, made the general observation, that in his opinion, "there is more air support of all types being provided U.S. forces in South Vietnam than is needed." However, he recognized that "such opinion would not find support at MACV, CINCPAC, or JCS." He pointed out: "Since we have it, and if its use will reduce American casualties, it will be used. Reduction of ARC LIGHT will save dollars, but that's not a winning argument when the other side of the case is made on reduction of casualties." Additional comments:[35/]

"From my exposure at MACV Hq and especially hearing General Abrams on the subject, there would be no interest in reverting to the 1,200 sortie rate per month while retaining a surge capability. MACV feels strongly that ARC LIGHT makes a major contribution toward the defeat of the communists.

"Were the sortie rate to be lowered it would impact on 7AF operations in two ways. First, there would be fewer ARC LIGHT strikes made Out of Country. While there are not many now I am optimistic that there will be more during the NE Monsoon period. Secondly, with a reduced ARC LIGHT effort I would expect a greater demand for tactical air sorties In-Country with a resultant decrease in Out of Country interdiction operations."

As expected, COMUSMACV and CINCPAC strongly recommended continuance of the 1,800 sortie per month rate. It was contended that the requirement existed for more ARC LIGHT sorties than were presently available. COMUSMACV estimated that three times the present sortie allocation could be profitably utilized.[36/] Experience had proven, however, that ground commanders had traditionally expressed a desire for more firepower than was available. This was especially true with regard to airpower.

COMUSMACV looked upon the ARC LIGHT force "as his flexible reserve under his centralized control, with the punching power of several ground divisions, always readily available to counter enemy threats or support ground operations throughout South Vietnam." The MACV concept was that this capability provided COMUSMACV the means for influencing the battle without the constant shift of major troop units, with the attendant vacuum that would ensue; ready availability of the ARC LIGHT force denied the enemy the opportunity to exploit his capability to choose the time and place for engagements under his terms.[37/]

All strikes within South Vietnam were tied directly to a specific situation on the ground, such as direct support of friendly ground operations, or specified interdiction targets requested by ground commanders based on all intelligence means at their disposal. In an effort to insure best utilization of

ARC LIGHT capabilities, COMUSMACV, Gen. Creighton W. Abrams, Jr., had three General Officers review all target recommendations from all sources twice daily, consider available intelligence, relate the requests to the enemy threat and the ground situation, prior to presentation to him. General Abrams then determined the targets to be struck. Adm. John S. McCain, Jr., Commander-in-Chief, Pacific Command, noted that "this personal attention to the operation is indicative of the importance attached to the striking capability and flexibility of the ARC LIGHT force."[38/]

Since the bombing restriction was imposed in North Vietnam, the enemy had moved his supply bases closer to South Vietnam. The enemy length of supply routes that were subject to disruption and destruction by airstrikes was thus greatly shortened. This situation had permitted the enemy to move men and materiel relatively quickly to mount attacks on lightly held friendly outposts. CINCPAC pointed out that the flexibility of the ARC LIGHT force to provide heavy striking power quickly throughout South Vietnam had enabled COMUSMACV to successfully counter or preempt the enemy's attacks. He explained further:[39/]

> *"In one instance, where no ground forces were available to come to the relief of a friendly outpost, the enemy was stopped by repeated B-52 strikes alone. This flexibility has permitted COMUSMACV to rapidly shift, strike, and disrupt the enemy each time he is found to be massing for an attack. The B-52s used in this manner, under COMUSMACV's centralized control, have become a tool of such effectiveness that COMUSMACV considers that he has no substitute within the conventional arsenal. Without the B-52 sorties, more ground troops would be needed to achieve the results obtained since the initiation of the B-52 concept."*

It was further noted that ARC LIGHT strikes had been instrumental in breaking

up enemy attacks, in striking previously inaccessible areas, and neutralizing enemy positions, thereby allowing helicopter insertion of allied troops, and in preparing areas for armored/infantry attacks. The results of these strikes had been "relatively high enemy KIA counts with negligible friendly casualties in follow-up ground operations." Field commanders reported much of the success enjoyed was attributable to the destructive and demoralizing effects of the B-52 strikes prior to the ground attack. CINCPAC judged the overall effect as being "to reduce the enemy's capability and will to fight."[40/]

In addition to COMUSMACV's stated requirement for ARC LIGHT strikes in-country, B-52s were "needed and used" to reduce the infiltration from North Vietnam through Laos into South Vietnam. Regarding the interdiction role, CINCPAC said: "Many sorties have been effectively used for this purpose in the past and additional B-52 sorties are required in support of CINCPAC's northeast monsoon operations. A significant portion of the total airstrikes required for this operation will be against perishable area targets such as truck parks, storage areas, and other areas of concentrated military activity caused by continued route interdiction. When the tactical situation dictates, B-52 sorties will be the primary means for striking these perishable area targets."[41/]

CINCPAC summarized his position, and that of COMUSMACV:[42/]

> *"The requested support for ground operations alone is greater than can be provided. Requirements to strike infiltration routes, base camps, truck parks, and other lucrative targets must take second priority when the support of our ground forces is critical. With the personal management provided by General Abrams, the best utilization of this massive firepower capability is being realized.*

"Strongly recommend that the 1,800-sortie-per-month rate be continued until there is some major change in the strategic and tactical situation which warrants its reduction or the commanders determine, as based on military experience and judgment, that it can be reduced."

The ARC LIGHT sortie rate was the subject of high level scrutiny in Washington, the end result being a continuation of the 1,800-sortie rate into 1969.[43/] This problem was not a new one. Throughout the history of the ARC LIGHT program, each succeeding rise in the sortie rate brought forth increased requirements from ground commanders for B-52 strikes, despite the impact an increase might have on the primary SIOP mission or total force utilization.[44/] For example, on 21 November 1967, while serving as SAC's Deputy Chief of Staff, Operations, Lt. General Alvan C. Gillem, II, who currently serves as Commander, 3d Air Division, noted:[45/]

"The ADVON was asked to attempt to influence--on a low key basis--MACV toward keeping the sortie rate at the prescribed 800 per month or something closer to it than has been the case so far this year wherein the sortie rate has climbed steadily upward. We know there's a war on but there's also a limit to the number of sorties 3AD can accommodate recognizing extra workload occasioned by FCFs, generation of spares, weather evacs, etc. Except in extreme emergency, we want to hold them to the agreement that QRs used come out of the next day's normal allocation."

Earlier, in February 1967, General Gillem had expressed concern over the fact that MACV was tasking the ARC LIGHT force at a higher rate than had been planned and agreed upon. Recognizing there would be "hump periods which we will do our best to support," he emphasized that an efficient and sustained effort was dependent upon recognizing and following the planning factors previously provided by SAC.[46/]

Evolution of the Force Posture

Historical graphs on B-52 operations in SEA have recorded a spiralling curve in the ARC LIGHT sortie rate from the first strikes in 1965 through 1968. (Fig. 4.) This consistently elevated curve, effected through JCS approval, was in direct response to COMUSMACV's growing dependence upon the massive fire-power delivered by the B-52s and his continuing demands for increased sorties.[47]

Attendant to the steadily rising ARC LIGHT sortie rate was an increase in the B-52 force at Andersen and an expansion of the Western Pacific B-52 force into countries other than Guam. There was a concurrent buildup in the KC-135 tanker force to support both the B-52 and PACAF tactical fighters. The KC-135 posture is discussed in Chapter II.

When planning was first begun in 1964 to introduce B-52 operations into the SEA conflict, there were only 12 rotational B-52s available in the Western Pacific. These were "B" model aircraft which were postured at Andersen AFB on SIOP reflex alert. Mission-oriented toward the delivery of nuclear bombs, the reflex B-52s were configured only for bomb bay loads.[48]

With the implementation of SAC OPlan 52-65 in early 1965, thirty-three B-52s were deployed on a rotational basis from the United States to furnish the bomber complement of the ARC LIGHT Task Force. These new arrivals were B-52Fs which had been modified to carry conventional stores on external wing racks; they had the capability of carrying 51 conventional 750-lb. bombs--12 under each wing and 27 in the bomb bay. The bombers could also be readily converted to carry their normal bomb bay load of nuclear weapons.[49]

Functioning as a separate and distinct unit from the reflex force, the ARC LIGHT Task Force remained in a training and planning status until 18 June 1965, when the first ARC LIGHT mission was launched against a Viet Cong staging area in Binh Duang Province, South Vietnam.[50] From this initial mission throughout the first year of operations, the B-52s flew a monthly average of 352 ARC LIGHT sorties and dropped a monthly average of 15,000 iron bombs. (Fig. 5.) During this same period, the monthly average of B-52s assigned to the 3d Air Division numbered 33.[51] (Fig. 6.)

While the number of assigned aircraft remained constant throughout this first year of operations, the sortie rate did not. There was a steady elevation in average monthly sorties: 218 the first three months, 309 the next three months, 378 during the first three months of 1966, and 411 during the April-June 1966 period.[52] From the outset, ground commanders were regularly stating requirements for ARC LIGHT sorties in excess of planning parameters for existing resources.

Gen. William C. Westmoreland, who served as COMUSMACV prior to General Abrams, continued to press for an increase in the ARC LIGHT sortie rate. SAC preparatory actions included the possibility of an increased bomber force at Andersen. SAC planners also began to explore the possibility of utilizing other installations in the Western Pacific area. Location of B-52 bombers at Kadena AB or the newly constructed U-Tapao Airfield in Thailand was being considered.[53]

In early September 1966, SAC notified the 3d Air Division that the sortie level would be elevated to 600 per month beginning in November 1966. The

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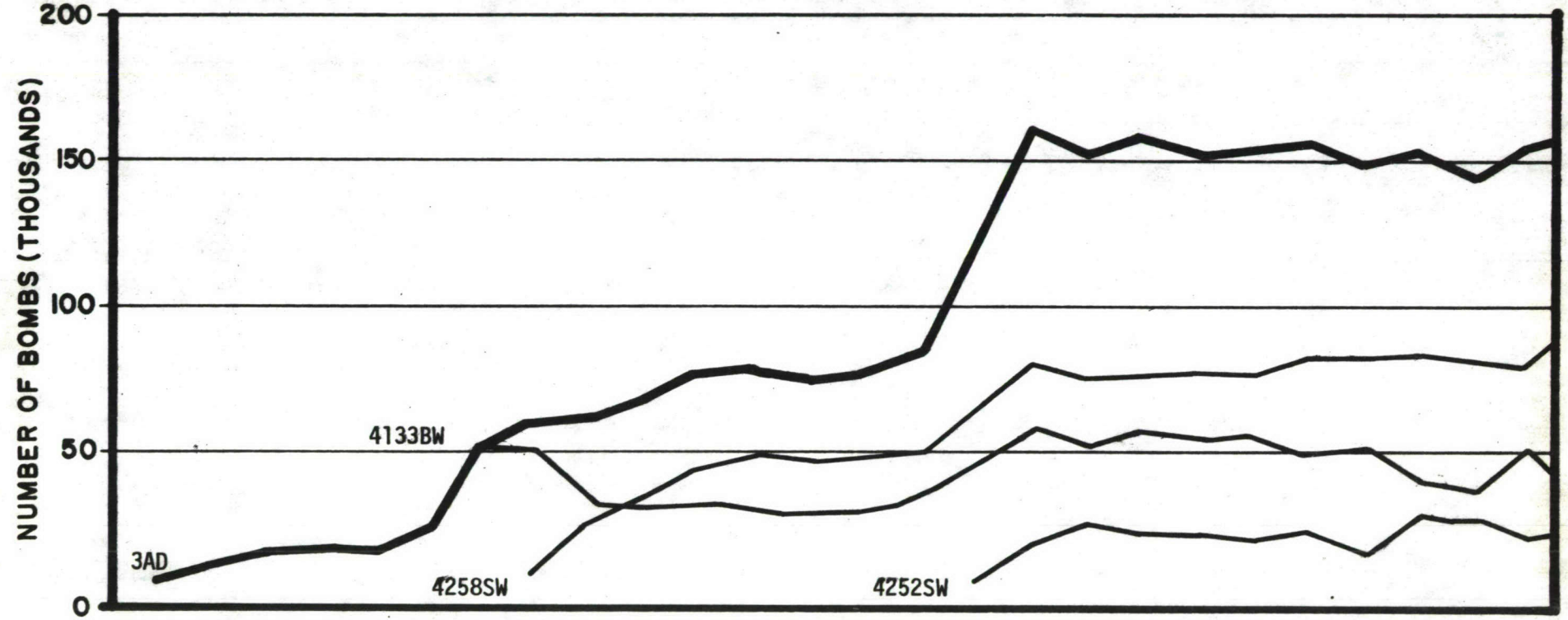
3D AIR DIVISION MONTHLY IRON BOMBS - ARMED RELEASES



	1st	2D	3D	4th	1st	2D	3D	4th	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
4133 BW	10.4	14.9	18.2	18.3	19.0	26.6	53.0	51.4	34.8	31.8	32.8	30.9	30.0	30.7	35.7	47.2	59.8	52.3	58.5	55.5	55.9	49.8	51.2	41.6	38.2	52.5
4258 SW								11.7	29.4	39.1	45.8	49.9	46.3	47.7	49.4	65.9	80.1	74.1	75.7	77.2	76.9	83.1	83.0	83.5	80.2	78.3
4252 SW																8.2	19.7	25.9	23.9	23.4	21.9	24.6	15.2	28.1	27.2	24.2
3 ADIV	10.4	14.9	18.2	18.3	19.0	26.6	53.0	63.1	64.2	70.9	78.6	80.8	76.3	78.4	85.1	121.3	159.6	152.3	158.1	156.1	154.7	157.5	149.4	153.2	145.6	155.0
	MONTHLY AVERAGE								FISCAL YEAR 1968												FISCAL YEAR 1969					
	QTR/FY 66				QTR/FY 67																					

FIGURE 5

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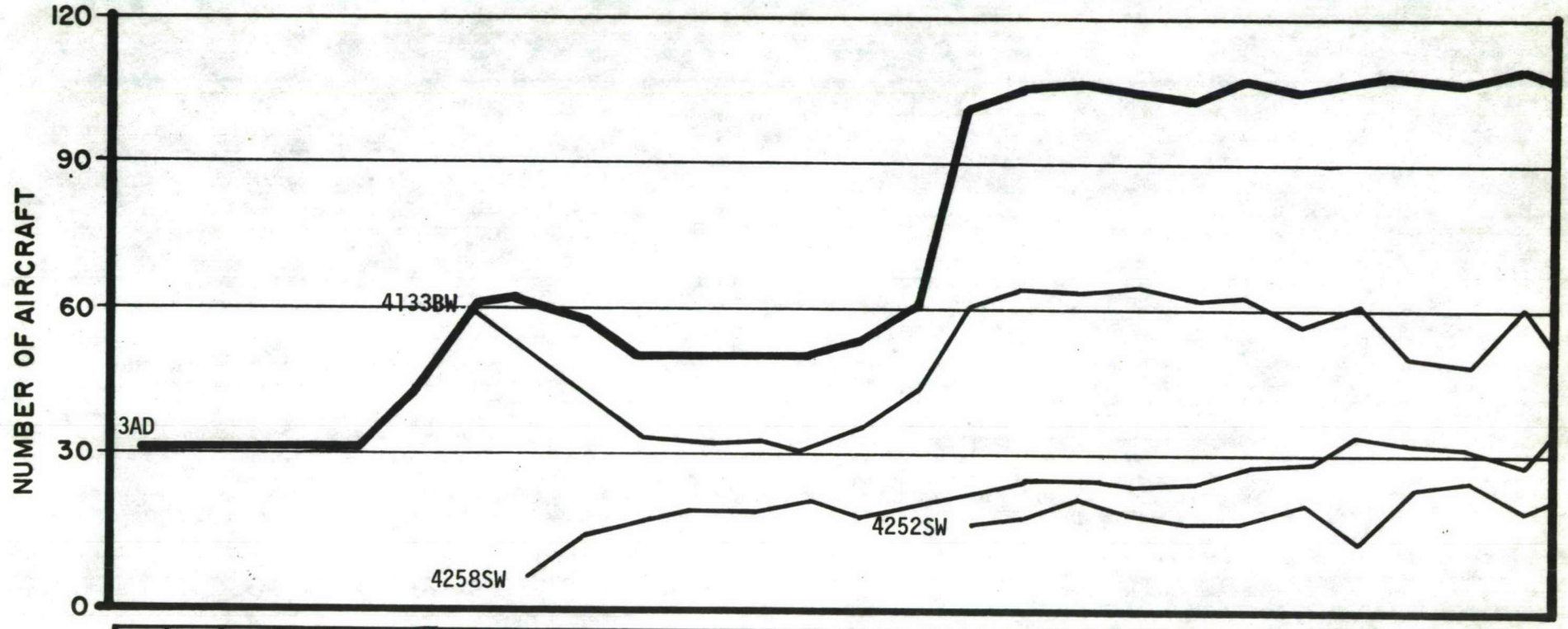
3D AIR DIVISION MONTHLY AVERAGE ASSIGNED AIRCRAFT - B-52



	1st	2D	3D	4th	1st	2D	3D	4th	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
4133 BW	33	33	33	33	33	42	60	54	45	35	34	34	31	36	42	61	64	62	64	62	63	57	61	51	48	61
4258 SW								7	14	16	17	17	20	17	18	23	25	25	24	25	28	29	35	33	32	28
4252 SW																16	17	20	18	17	17	20	12	24	26	20
3 ADIV	33	33	33	33	33	42	60	61	59	51	51	51	51	53	60	100	106	107	106	104	108	106	108	108	106	109
	MONTHLY AVERAGE								FISCAL YEAR 1968												FISCAL YEAR 1969					
	QTR/FY 66				QTR/FY 67																					

FIGURE 6

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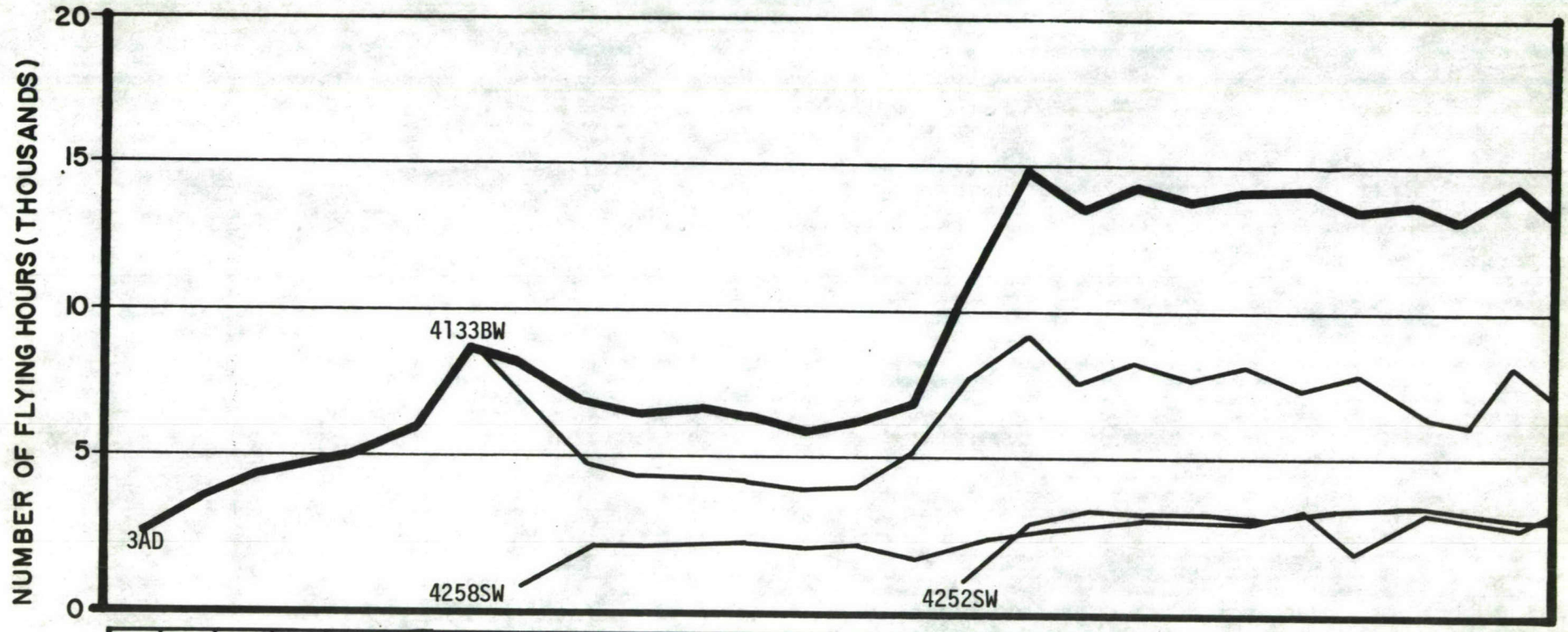
3D AIR DIVISION MONTHLY FLYING HOURS - B-52



	1st	2D	3D	4th	1st	2D	3D	4th	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
4133 BW	2.5	3.6	4.4	4.8	5.3	6.2	8.9	7.4	5.1	4.5	4.5	4.3	4.0	4.2	5.3	8.1	9.4	7.6	8.4	7.9	8.3	7.5	8.0	6.8	6.2	8.4
4258 SW								.9	1.9	2.1	2.3	2.3	2.2	2.3	1.8	2.4	2.7	2.8	3.0	3.0	3.0	3.4	3.7	3.4	3.4	3.0
4252 SW																1.1	2.7	3.4	3.1	3.1	3.0	3.4	2.0	3.7	3.5	3.1
3 ADIV	2.5	3.6	4.4	4.8	5.3	6.2	8.9	8.3	7.0	6.6	6.8	6.6	6.2	6.5	7.1	11.6	14.8	13.8	14.5	14.0	14.3	14.3	13.7	13.9	13.1	14.5
	MONTHLY AVERAGE								FISCAL YEAR 1968												FISCAL YEAR 1969					
	QTR/FY 66				QTR/FY 67																					

FIGURE 7

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Division was also advised that plans called for a further elevation to 800 sorties per month in January 1967.[54/]

The B-52Fs were replaced by 33 "D" models in 1966. This force was augmented by 17 additional B-52s in November and December 1966, with 11 more bombers arriving in January 1967. The assigned bomber force, provided on a rotational basis by SAC units in CONUS, now stood at 61 aircraft.[55/]

Action was also initiated in early 1967 under the nickname POKER DICE to locate a B-52 force at U-Tapao, Thailand. A Thailand-based force offered the obvious advantage of proximity to SEA targets, whereby turnaround times could be reduced--allowing an increase in sorties per aircraft. Movement into U-Tapao was phased, with the first increment of three aircraft deployed from Andersen on 10 April 1967.[56/]

The History Report of the 3d Air Division for that period explained the advantage offered by the Thailand-based B-52s:[57/]

> *"When the POKER DICE buildup of the bomber force at U-Tapao was completed and the full 15 aircraft MOB level became a reality, it was expected that the 4258th Strategic Wing would be able to launch 540 sorties per month or 1.2 sorties per aircraft. During July through October 1966, 33 Andersen-based bombers were launching an average of 440 sorties per month over the longer route which included a mid-air refueling by tankers of the 4252d Strategic Wing."*

Also, to the field commander requesting a B-52 strike, proximity of the Thailand force meant a more rapid response and a much better chance of destroying highly volatile and perishable targets such as reported or anticipated troop

concentrations. This operational capability was initially hindered by restrictions on B-52 overflights of Laos, but this restriction was later removed.[58/]

As a result of the advantage accrued from forces being launched from U-Tapao, SAC was able to effect a reduction of ten 3d Air Division B-52s without an impact on sortie capability. The force level was lowered to 51 aircraft in July 1967, but the reduction was to be short-lived. COMUSMACV continued the pattern of pressing for a higher level of ARC LIGHT sorties, and on 21 November 1967, the Secretary of Defense approved a surge to 1,200 sorties monthly, beginning on 1 February 1968.[59/]

To meet the increased sortie demands, the 3d Air Division was scheduled for a force augmentation of 28 B-52s, with five of the additional aircraft to be positioned at U-Tapao. At the beginning of the 1 February 1968 increase to 1,200 monthly sorties, SAC's WESTPAC B-52 force totaled 79 aircraft--59 at Andersen and 20 at U-Tapao. As it turned out, the increase to 1,200 sorties and the associated augmentation were both overtaken by events. Within a two-week period, an emergency deployment would place the total bomber force at 105 B-52s, ARC LIGHT operations would be launched from three bases, and the monthly sortie rate would surge to 1,800.[60/]

In response to the Pueblo Incident, 26 additional B-52s were deployed to the Western Pacific in early February 1968. Known as the PORT BOW force, 11 of these aircraft were positioned at Andersen, and 15 were deployed to Kadena AB, Okinawa. This raised the total 3d Air Division B-52 force to 105 aircraft.[61/]

Concurrently, the Khe Sanh situation and the widespread Tet Offensive

emerged in Southeast Asia, with the subsequent result that the Joint Chiefs of Staff (JCS) authorized an elevation in the ARC LIGHT sortie rate to 1,800 sorties monthly and integration of the PORT BOW B-52s into the ARC LIGHT program.[62/]

Within the space of three weeks, the SAC WESTPAC force operated at 800 sorties monthly (before 1 February), 1,200 sorties monthly (1-14 February), then at the 1,800-sortie monthly surge level. Although initially provided as an emergency surge during the Tet Offensive, the sortie level remained at 1,800 monthly through 1968 and into 1969. The PORT BOW forces remained with the 3d Air Division, and the force posture remained at more than 100 B-52s throughout the year.[63/]

With the advent of the 1,800-sortie/month level, a more flexible response capability was built into the ARC LIGHT operation. This capability was known as BUGLE NOTE and was based on the similar but limited tactics adopted earlier, i.e., IDC, GDF, and QR. Devised during February 1968, when Khe Sanh was under siege, the BUGLE NOTE concept provided for three sorties over target every one and one-half hours, and targets could also be changed in the same amount of time prior to TOT. The History Report of the 3d Air Division for that period described the BUGLE NOTE concept:[64/]

> *"To provide this added degree of flexibility, cells of three B-52s would first proceed to their pre-IP (different for each launch base); at or before the pre-IP, a beacon check contact with the MSQ site would then be performed and the MSQ site would then further direct the cell to the selected gate entry and also give the outbound heading to be taken from that point. A number of gate entry points were identified for use by bombers launching from all three bases. The SAC ADVON together with MACV were to select the appropriate*

IP (or gate entry point) to be used and the track to be flown from that point to the target. All target weaponeering was also to be accomplished by the SAC ADVON who would also provide the selected MSQ site with the DPI (designated point of impact) and bomb train length."

In operation, it was proved more effective to put six aircraft over the target every three hours rather than three every hour and a half. This provided better target saturation, and more time to evaluate results before the next strike arrived. Also, the BUGLE NOTE procedure proved so effective that it was expanded to cover all of the operational area. Each BUGLE NOTE area had two gates or sites through which aircraft could enter. Aircraft could be diverted to alternate or secondary targets within the same BUGLE NOTE area as late as minutes short of the planned TOT. Diversions to another BUGLE NOTE area required a longer lead time.[65/]

The key to the BUGLE NOTE concept was the 3d Air Division's system of cyclic TOTs, wherein not only B-52 generation was optimized but near automatic in-country conflict clearance was provided.[66/] Tight scheduling of aircraft, aircrews, and supporting personnel enabled the force to achieve and maintain the 1,800 sortie level from 17 February 1968 through the first half of 1969. The cyclic scheduling technique developed by division planners afforded block generation, launch, and recovery of the B-52s to insure adequate turnaround time and maximum sortie production with the forces available. The end result of cyclic scheduling was a readily available, responsive B-52 strike force to COMUSMACV.[67/]

The 1,800-sortie-per-month rate equated to 60 sorties per day, flying ten

3D AIR DIVISION
B-52 FORCE/SORTIE BREAKOUT

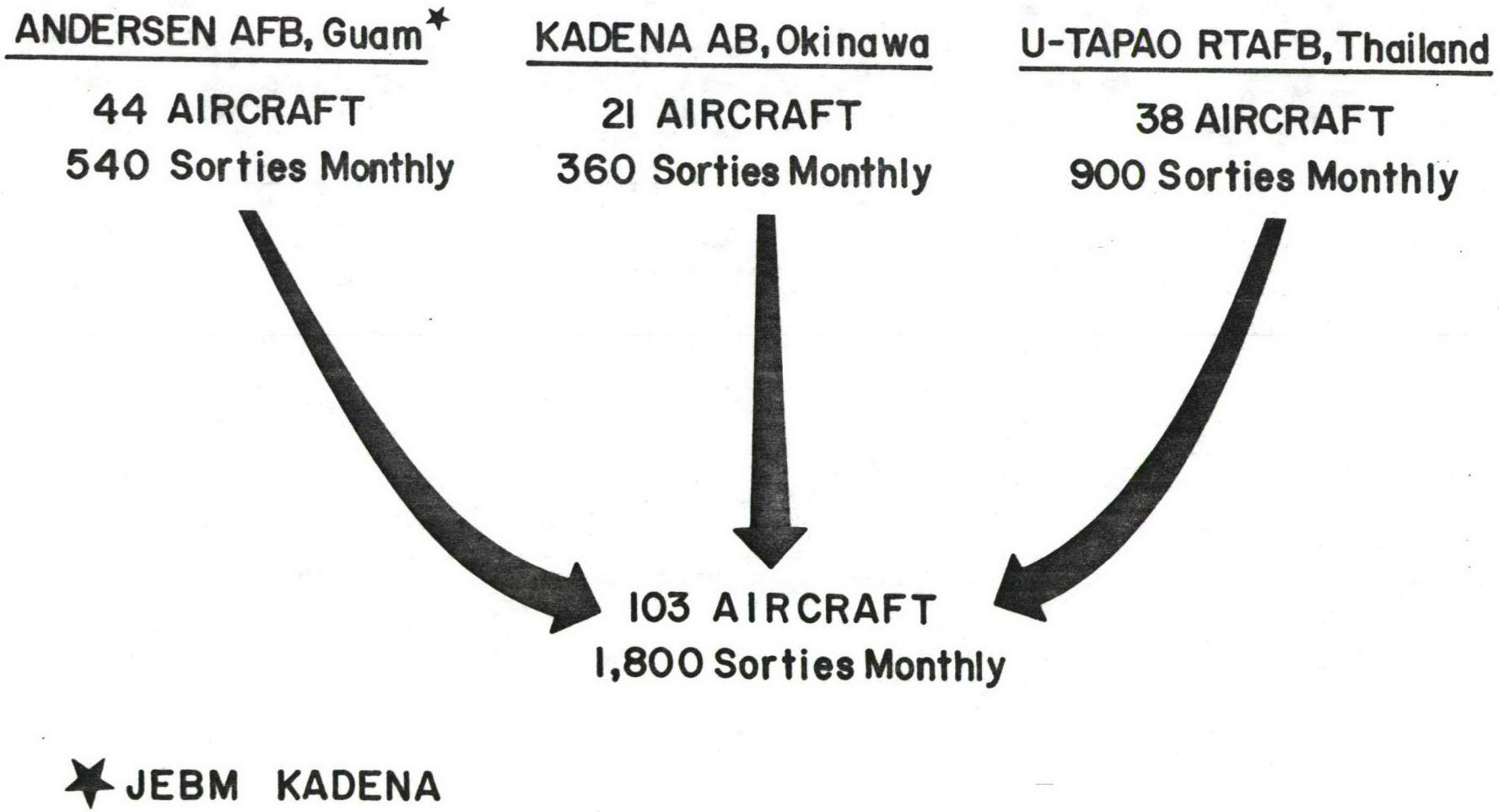


FIGURE 8

SOURCE: 3AD (DOPL)
March 1969

strike missions composed of six aircraft each. The 3d Air Division's capability to furnish sorties over target was a function of aircraft and base mix, materiel, aircrews, and munitions. The most effective utilization of the three operating bases was a foremost consideration. For instance, prior to the end of 1968, all B-52 aircraft inspections and repairs were made at Andersen AFB, since it was the main operating base (MOB) for the ARC LIGHT effort. As a forward operating base (FOB), Kadena afforded savings in flight time and tanker requirements which improved sortie rates, compared with using Andersen, thus decreasing the total number of B-52s required to maintain a given sortie rate. Even more important in this regard was U-Tapao Air Base, also an FOB, since it offered the shortest sortie flight time. Aircraft operating from U-Tapao required no aerial refueling and could carry maximum bomb tonnage; however, clearance and available support facilities in Thailand limited the number of B-52s that could be operated from U-Tapao.[68/]

To more effectively utilize B-52 resources, efforts were underway in early 1968 to expand the force posture at U-Tapao; however, clearance problems and other factors delayed this action until the end of the year. Attendant to this expansion was a rise in the sortie level at that base to 900 sorties monthly--one-half of the total monthly ARC LIGHT commitment. The Wing at U-Tapao was designated a B-52 main operating base, and the maintenance capability was increased to include phase inspections, Jet Engine Basic Maintenance (JEBM), and corrosion control. Action was also underway to increase the maintenance capability at Kadena.[69/]

Average Division B-52 aircraft/crew beddown, after the expansion at

U-Tapao, was generally as follows:[70/]

B-52 Beddown/1800-Sortie Rate

Base	Nr Acft	Sort/Day	Sort/Month	Hrs/Month	Nr Crews
U-Tapao	35	30	900	3,610	46
Kadena	18	12	360	3,190	30
Andersen	50	18	540	6,200	62
TOTAL	103	60	1,800	13,000	138

Cyclic TOT flow:[71/]

TOT (Z)	U-Tapao	Andersen	Kadena
0000	6	6	
0225		6	
0450	6		
0715		6	
0940	6		
1205			6
1430	6		
1655		6	
1920	6		6
TOTAL	30	18	12

In B-52 operations, munitions availability related directly to sortie capability. The B-52 had the capability of carrying 60,000 pounds of conventional ordnance consisting of 500-, 750-, and 1,000-pound high explosive bombs, cluster bomb units, and munition canisters containing antipersonnel bomblets.[72/] Munitions available in the 3d Air Division were distributed to the three operating bases to allow B-52 bomb loads to be varied in a trade-off between munitions and fuel, so as to optimize both weapons tonnage and aircraft range. With this optimization, the Andersen and Kadena preferred loads were 42 M-117s internal,

U-TAPAO ARC LIGHT

DAILY COMMITMENT

FIVE WAVES – SIX AIRCRAFT PER WAVE

	BRIEF	TAKEOFF	LAND
IVORY - WALNUT	0205	0430	0750
SCARLET - GRAPE	0635	0900	1220
WINE - MAPLE	1145	1410	1730
COPPER - EBONY	1625	1850	2210
CHARCOAL - HAZEL	2125	2350	0310

FIGURE 9

24 MK-82s external, while the U-Tapao preferred load was 84 MK-82s internal, 24 M-117s external.[73] As of October 1968, the Division had a monthly munitions allocation of 115,200 MK-82 bombs and 45,600 M-117 bombs.[74]

Rules governing the strike force were generally as follows:[75]

- In the selection of targets and the conduct of operations, precautions would be taken to avoid noncombatant casualties.
- Targets would be a minimum distance of one kilometer from nearest noncombatants and would not contain monuments, temples, or other landmarks, the destruction of which might cause political problems.
- Procecures would be established for the emergency release of bombs, by an aircraft in distress, without endangering noncombatants or friendly forces.
- All strikes against targets wholly or partly in Laos required concurrence of the American Embassy in Vientiane by positive message response.
- ARC LIGHT strikes within range of a possible SAM site would be provided maximum feasible protection to include aircraft with ECM/ELINT, anti-radiation missile, and conventional ordnance capability. Procedures were established for warning and diversion of B-52s in SAM Threat areas.
- Close-in support bombing would be no closer than 3,000 feet to friendlies and axis of attack tangent to their location.

Since many lucrative targets in the Southeast Asian geographical environment did not lend themselves to point definition, the ARC LIGHT force was employed against area targets in contrast to point targets. A JCS Study in May 1968 explained the weaponeering involved in striking area targets:[76]

"Experience has indicated that three B-52 bombers per square kilometer will provide the minimum acceptable level of saturation. MACV is currently using a standard target box one kilometer by two kilometers and executing all missions with six aircraft per mission. With ground radar control of missions, the lead aircraft in one cell (three aircraft) is vectored on a path 900 feet from one side of the target box. The second and third aircraft of each cell will offset 200-300 feet right and left of their respective lead aircraft. All six aircraft will begin bomb impact 500 feet inside the target box and deliver a train of bombs 5,000 feet long (approximately 47.5 feet between bombs) and complete the drop approximately 1,000 feet short of the far end of the target box. This method of attacking a target delivers six parallel trains of bombs through the length of the target box with a high assurance of all bombs falling within the target box. With instantaneous fuzing, the 750-pound bomb has an effective radius of 90 feet and the 500-pound bomb has an effective radius of 75 feet."

Strike tactics varied according to three basic target distinctions: Non-threat, Threat, and Close-in. For each of these situations:[77/]

NON-THREAT	THREAT	CLOSE-IN
Flight Level 30,000/32,000	Flight Level 33,000/38,000	Flight Level 30,000/32,000
440 Knots True Air Speed (KTAS)	470 KTAS	440 KTAS
2-Nautical Mile (NM) Separation	2-NM Separation	1 NM Separation
Synchronous or MSQ	Synchronous or MSQ	MSQ

With the growing dependence on MSQ directed strikes, 3d Air Division continued to seek to improve overall effectiveness in conducting B-52 strikes under MSQ direction. Standard aircraft station keeping procedures were being used. This aligned the number two and three aircraft of a three-ship cell directly in trail behind the cell leader. In many instances, this resulted in

B-52s at U-Tapao RTAFB, Thailand

Figure 10

B-52 Refueling
Figure 11

bomb trains either impacting along the same line or within such proximity that weapon efficiency was lost and a large section of the target box remained untouched.[78]

An initial attempt to correct this deficiency was made in September 1968 by use of a tactic designated "Wedge Angle". Although some measure of success was realized in increasing lateral train separation, the tactic was proven restrictive in several areas. In January 1969, Drift Angle Station Keeping (DASK) procedures were developed. By presetting the ASQ-48 Drift Angle Control to a predetermined value and then aligning the lead aircraft under the radar scope's electronic azimuth marker, the radar navigator offset the aircraft's track the desired distance from the lead aircraft's track. Using these procedures, the number two aircraft in a cell was offset 500 feet left of lead. K-17 scored results showed DASK procedures to be highly accurate and effective. Full use of the procedure against area-type targets was approved by SAC headquarters on 20 March 1969.[79]

Review of Effectiveness

From the operational point of view, effectiveness was the rate of efficiency at which the B-52s delivered their ordnance to satisfy the requirements stated by COMUSMACV. This rate was expressed as the percentage of those sorties which successfully delivered their ordnance on the Designated Points of Impact (DPI) as compared to those scheduled. In this regard, the 3d Air Division was highly effective: the operational rate of the ARC LIGHT operation had remained at the 97-99 percent level.[80]

Effectiveness expressed in terms of strike results and its overall

contribution in supporting COMUSMACV objectives have been considerably more difficult to measure. The answer is directly related to the effectiveness of MACV's targeting system and the validity of COMUSMACV's utilization of the ARC LIGHT force. ARC LIGHT targeting and utilization of the force by COMUSMACV appear to have improved considerably since the program's inception in 1965; however, the greatest enhancement in this regard is deemed to be the improved force posture tactics developed by the 3d Air Division, wherein a great degree of flexibility has been provided in striking time-sensitive targets.

Beginning with Operation NEUTRALIZE in the autumn of 1967 and then Khe Sanh in early 1968, the B-52 strike force appeared to evolve into being a major element of COMUSMACV's strategy, wherein emphasis was directed at "minimum American casualties." In COMUSMACV's words: "It [the B-52] is not like tactical air. It is not like naval gunfire. It is not like ground artillery. It is just capable of doing something that none of the rest can hack." He noted that MACV forces had more tactical air, artillery, and naval gunfire "than ground troops have ever had before," but even this was not deemed sufficient, "not without the expenditure of an awful lot of lives."[81/]

General Abrams cited an example that occurred in June 1968:[82/]

> *"The enemy artillery above the Ben Hai River was giving us fits. They were shelling us quite accurately day and night. We put all kinds of tactical air, naval gunfire, and counter battery fire by ground artillery. In the meantime, we were using the B-52s largely in III Corps. Then...on the first of July about 8 o'clock in the morning in a 50-minute period, 30 B-52 sorties went in there north of the Ben Hai against the artillery. When that was over, tactical air, naval, and ground artillery picked it up.*

Then about 5 o'clock in the afternoon, 30 more B-52 sorties in 50 minutes. About six more days of this and then we went 45 days without a round being fired into South Vietnam."

The mission that General Abrams defined for the ARC LIGHT program as of mid-1968 was "to assist in the defeat of the enemy through maximum destruction, disruption, and harassment of major control centers, supply storage facilities, logistic systems, enemy troops, and lines of communications (LOCs) in selected target areas." Targets were generally selected to accomplish the following tasks:[83/]

- Systematic destruction of base areas containing enemy installations, defensive fortifications, or other physical structures.
- Harassment and interdiction of troop concentrations, movement of enemy supplies, bunkers, fortifications, automatic weapons positions, trenches, and foxholes.
- Support of ground operations by preventing the massing of enemy forces and by destroying prepared defenses or enemy attack units.
- Spoiling operations which were missions directed against the enemy for the purpose of preventing the reinforcement or orderly withdrawal of enemy units, and those operations directed against enemy troop concentrations for the purpose of upsetting known or estimated military plans.

From the outset of ARC LIGHT, a collection of factors gathered to preclude an orderly accumulation of accurate BDA. Broadly grouped, these obstacles fell under the heading of: (1) Operational Ground Rules and (2) Tactical and Environmental Factors. Throughout its four years of activity, the ARC LIGHT operation had proved itself highly flexible and rapidly responsive to the changing needs of the COMUSMACV, but at all stages in its development, one

basic planning factor (with rare exception) remained unaltered and intact: the B-52 was used only for area saturation bombing or "carpet laying." Given the triple canopy jungle area in which the vast majority of targets were located and a bombing altitude of 30-33,000 feet, it was patently obvious that B-52 crew members could not even see their targets let alone accurately estimate the kind and degree of damage inflicted. True, the bombers accomplished K-17 photography on daylight missions but the photographs served only to measure circular error probable (CEP), bomb train length, and the number of bombs falling within the box.[84/]

Crew members often spotted secondary explosions and during mission debriefing sessions, Intelligence was able to learn how many secondaries were spotted, together with their size and color, which at least served to confirm an enemy presence in the target box. Other factors working heavily against adequate BDA accumulation were:[85/]

1. Remoteness of Target Area. One of the great advantages of the B-52, its ability to strike distant targets, also precluded the scheduling of many post-strike ground follow-up (GFU) operations.

2. Weather. Again, another advantage of the B-52 was continually and successfully exploited--its all-weather capability. Unfortunately, heavy cloud cover also caused many post-strike photography missions to be canceled thereby severely limiting the amount of photographic BDA available. This was particularly true during the siege of Khe Sanh.

In addition to immediate GFU operations, considered the best source of accurate BDA, and post-strike photography, there were other sources of BDA

available for analysis, but to varying degrees, less objective and accurate. Prisoners and ralliers were interrogated but determining the reliability and accuracy of their testimony was at best a difficult task. There were also agent reports and testimony from nearby villagers made available, but these sources, too, were in varying degrees less than completely reliable.[86/]

The question of inadequate BDA was brought up by SAC representatives at the ARC LIGHT Conferences of 1966 and 1967 but little real improvement was noted in the months that followed. The JCS and COMUSMACV were also sensitive to the lack of hard, reliable BDA being gathered, and measures were taken to tighten existing reporting requirements and to impress field commanders of the importance of submitting timely and complete post-strike reports. But ground tactical exigencies always took precedence over reporting requirements and often caused scheduled GFU operations to be canceled.[87/]

The History Report of the 3d Air Division for July-December 1968 reported: "After the bulk of close-in bombing around Khe Sanh was completed, the CINCPAC could only report that the only method available for evaluation of close-in ARC LIGHT strikes was B-52 K-17 photography. Due to darkness and cloud cover, only about seven percent of the strikes launched had been scored in this manner."

The next example of ground follow-up BDA was provided by General Collins, Commander of the 4th Infantry Division, in November 1966. He first described the tactical situation prompting his request for ARC LIGHT strikes, then went on to describe the effects of these strikes. General Collins wrote:[88/]

> *"After the strike on Alpha 96, we went back and found the enemy resistance still heavy and discovered a series*

of bunkers in front of the area which had been struck. These bunkers became apparent as a result of the bombing from Alpha 96. We backed off, asked for strike Bravo 51, and again moved in on the enemy position and found that it had been vacated. Sixteen bodies were located in the area. One large tunnel was caved in. Parts of bodies could be seen, and it was estimated that a minimum of 50 enemy had been buried in the tunnel. In the area of strikes Alpha 67, Bravo 10, Bravo 37, Bravo 17, our forces were able to walk through the area without any opposition. While no enemy bodies were found in the area, there were many blood trails, and the area of strike Bravo 10 had the stench of death about it that one finds on a battlefield after many men have been killed. In addition, more than 50 enemy bunkers were destroyed."

A vivid eyewitness report by artillery forward observers was provided by the Commanding General, 3d Marine Division, on 11 February 1968:[89/]

"During ARC LIGHT strikes on tgts QT 1554'A' and QT 1737'A' at 091700H and 091750H, arty fwd observers observed all bombs on tgt, and between runs on tgt QT 1554'A' observed approx thirty (30) enemy running from previous aircraft stick. The subsequent acft stick dropped upon the 30 fleeing enemy with most gratifying results. After dust and debris cleared, approx 20-30 enemy were observed to be wandering around aimlessly at a different location than previously observed enemy. They were taken under arty fire. Confirmed BDA of ARC LIGHT and subsequent arty could not be obtained because of tgt location and onset of darkness, and visibility obscuration."

Numerous congratulatory letters and messages written by commanders in the field and the COMUSMACV were received by SAC and its 3d Air Division. Nearly all of these were highly effusive in their praise of ARC LIGHT operations, but seldom were they able to include hard figures on damage incurred. Typical of such a communique is the following letter from Lt. Gen. Lewis W. Walt, Commander, III Marine Amphibian Force, written on 4 August 1966:[90/]

"Since 13 Jul 66, 17 ARC LIGHT strikes have been flown in support of ARVN and U.S. Marine Forces in Op HASTINGS. There exists considerable evidence that these strikes caused significant destruction and disorganization of major elements of a NVA regiment. Coverage was accurate, timely, effective, and assisted in the attainment of successes enjoyed to date during the operation. The contribution of SAC to the overall effort of Op HASTINGS is greatly appreciated."

Obviously, the terms "considerable evidence" and "significant destruction and disorganization" are subjective and impossible to weigh in attaining an accurate appraisal of effectiveness. The great volume of such communiques and their unanimous agreement on the efficacy and value of ARC LIGHT do, however, help construct a strong circumstantial case for the value of ARC LIGHT, especially in light of insufficient BDA available to conclusively prove otherwise.

When requesting an Air Staff report on a number of ARC LIGHT related topics including the advisability of escalating to 600 sorties monthly, the Operations Section, Secretary of the Air Force, noted that: 91/

"General Westmoreland is personally directing B-52 operations through his J-2 and J-3 who are responsible for target development and operational coordination, respectively.

"General Westmoreland is the most vigorous advocate of the B-52 bombing program.

"Since the beginning of 1966, and with a considerable increase in enemy forces, there have been only a very few multi-battalion offensive operations initiated by the enemy. General Westmoreland gives much of the credit for this achievement to the B-52s. He sincerely believes the enemy has been forced to keep on the move and is afraid to mass his troops, all because of the B-52 bombing attacks."

After lifting the siege of Khe Sanh, MACV completed an in-house review of the action which shed extensive light on the role played by the B-52s. Some of the more salient points made by the study reflecting on ARC LIGHT effectiveness were:[92]

> *"The enemy could not counter, actively or passively, friendly artillery and the B-52 bombings. The bombing particularly, demoralized his troops and tore up his carefully prepared logistics system into the battlefield. It caused casualties and materiel losses that became unacceptable. Each ground attack approached the jump-off point weaker than the previous one and each was preempted by massive friendly firepower...to attack the Khe Sanh Combat Base he had to mass his forces, but if he did so he would be accurately struck by overwhelming firepower he could not counter.*
>
> *"By mid-February, although the enemy continued to replace and resupply, B-52 bombing was hurting him and was continually requiring him to divert considerable energy to evasion and defensive maneuvers.*
>
> *"Interrogation of the few ralliers show that the bombings were by now creating a perceptible worsening of enemy morale. By early February, desertions were growing daily. Deterioration of morale due to bombings was also spreading along the infiltration routes. Sometime prior to 29 February, 300 men of an infiltration group deserted while en route to Khe Sanh, from fear of B-52 raids."*

In July 1968, Gen. Creighton W. Abrams, Jr., the new COMUSMACV, evaluated in-country B-52 and tactical airstrikes in a letter to the CINCPAC. In his review of Khe Sanh, General Abrams echoed much of what appeared in the earlier MACV work, but also added some cogent commentary on the close-in bombing conducted by the B-52s:[93]

"Taking advantage of the CINCPAC Basic ARC LIGHT Operations Order allowing bombing to within one kilometer of friendly forces, a reduction from the normal three kilometers, was quite possibly the deciding factor at Khe Sanh. It was only after the B-52s dropped within 1,000 meters of the fence at Khe Sanh that the enemy showed signs of crumbling. Prisoners revealed that they had been briefed that B-52s were prohibited to bomb within three kilometers radius of the fence to be safe. PW reports stated that enemy battalions sustained from 50% to 75% casualties from B-52 strikes alone. Bomb pattern analysis, damage assessment, and visual sightings showed heavy enemy losses of stores, ammunition, and weapons. After the middle of March, the enemy was forced to abandon his plans. His losses in dead, wounded, and destroyed equipment cannot be completely assessed but were sufficient to cause him to abandon his attack and withdraw from the battlefield."

General Abrams also credited the B-52 with a significant contribution during the Battle of Dak To in November 1967, saying in part:[94/]

"B-52 strikes were especially effective in destroying enemy ammunition caches along remote ravines that could not be reached by ground troops."

Turning to the Battle of Saigon, which took place during 15 June-1 July 1968, General Abrams commented on the B-52 bombing of enemy safe areas and supply routes surrounding the South Vietnam capital. While at the time (10 July 1968), he thought it too early to offer a full assessment of the results of the missions he did say, "...indications are that again the enemy forces were thrown off

balance and were not able to launch their scheduled attacks of 15-16 June 1968, or for the rescheduled date of 24 June 1968. During this period, his stand-off attacks by fire on Saigon and outlying population areas, though initially heavy and numerous, were also reduced."[95/]

General Abrams summed up his evaluation by saying, "My conclusion is that the ARC LIGHT weapon system gives us a capability to influence battles throughout South Vietnam. It is more responsive to daily shifts in battle intensity than the most mobile troop reserve could be, and is being used in concentration with decisive results."[96/]

In either case, a reasonable conclusion to make is that ARC LIGHT effectiveness could be no better than the target intelligence used in selecting target areas. In passing his "well done" to SAC in May 1967, Air Force Chief of Staff, Gen. John P. McConnell, noted that to date more than 10,000 ARC LIGHT sorties had expended 98.5 percent of their bombs on target.[97/] Accuracy was obviously no problem nor was responsiveness. In the words of a 3d Air Division ARC LIGHT planner, "There never was an instance when we couldn't give MACV what it wanted, when it wanted it." Reaction times were progressively cut until expanded BUGLE NOTE ARC LIGHT missions could be directed against targets as little as 90 minutes out from the target. In the continued absence of sufficient accurate BDA and other firm indications of effectiveness, any assessment of the ARC LIGHT program will necessarily have to be highly subjective.

CHAPTER II

YOUNG TIGER REFUELING OPERATIONS

"I would like to extend my personal appreciation for the increased KC-135 tanker support now being provided to my Tactical Forces in Southeast Asia. The recent emphasis to bring more forces to bear on those targets deep within North Vietnam that are vital to the enemy's war effort, would not have been possible without this additional support." 1/

Gen. William W. Momyer, USAF

Evolution of the Force Posture

Southeast Asia air refueling operations by SAC KC-135s were conducted in support of 7AF tactical fighter operations and as an integral part of the ARC LIGHT Task Force. SAC refueling of TAC and PACAF aircraft in SEA had its beginning with a small Tanker Task Force located at Clark Air Base, Philippines. First activated as YANKEE TEAM on 6 August 1964, the operation later was nicknamed FOREIGN LEGION.

In 1965, the current YOUNG TIGER operation, known during its early months as TAMALE PETE, replaced the Philippines Tanker Task Force. The 4252d Strategic Wing was organized at Kadena Air Base, Okinawa, and assumed responsibility for the refueling mission. In February 1965, thirty additional KC-135s were deployed to Kadena in support of the B-52 force that would, within a few months, begin ARC LIGHT operations from Andersen Air Base, Guam. 2/

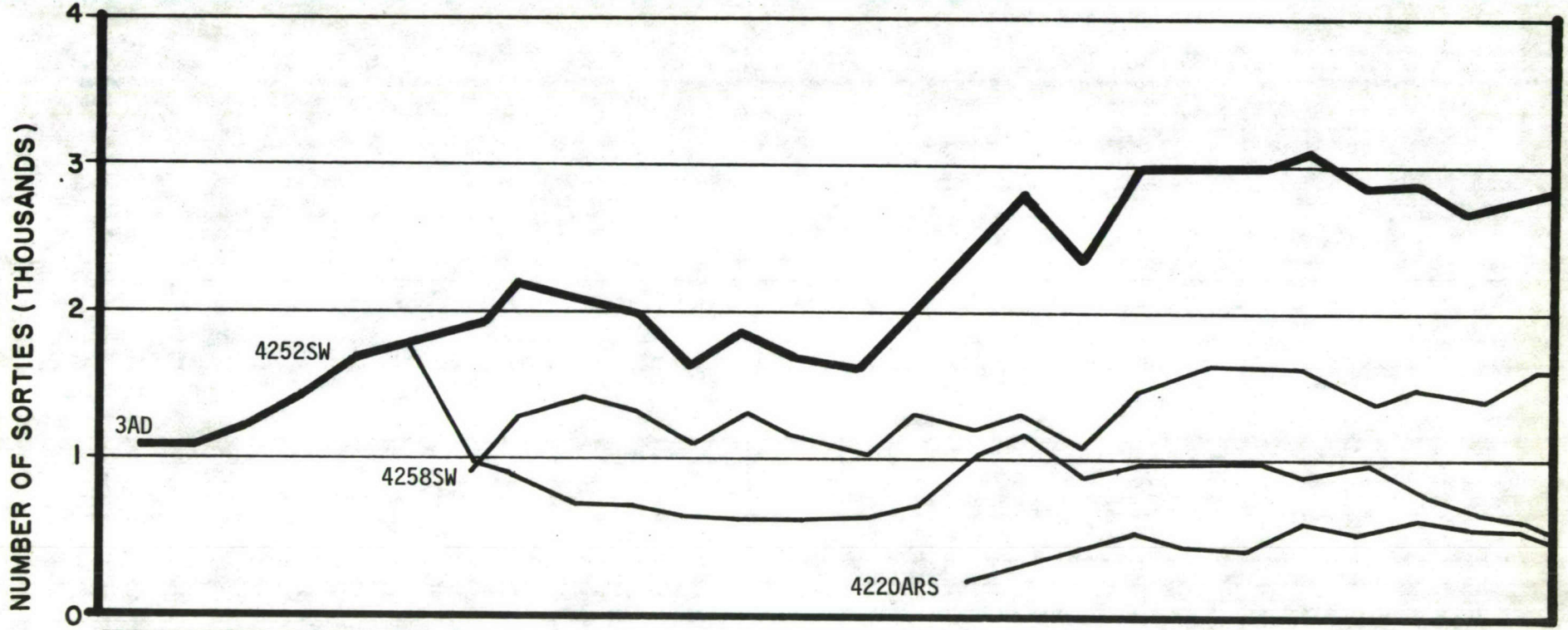
The YOUNG TIGER aircraft and crews were provided by units from within CONUS for a TDY period of 60 days and were continuously replaced on a staggered schedule; aircraft designated as the ARC LIGHT portion of the tanker force

belonged to the TDY Bomb Wing located at Andersen AFB, and were deployed for 179 days. Upon arrival at Kadena, all aircrews were placed under the operational control of the 4252d Strategic Wing's Deputy Commander for Operations. All crews were subject to flying any type mission scheduled by the Wing, whether ARC LIGHT or YOUNG TIGER. This was considered necessary to meet all the operational commitments and spread the flying time equally among the assigned crews.[3/]

Near the end of the first year of operations, ten additional KC-135s were added to the Kadena tanker force. This brought the total tanker posture to 45 aircraft, 30 for ARC LIGHT and 15 for YOUNG TIGER. Prior to their arrival, ARC LIGHT tankers were being used to meet PACAF refueling requirements; however, the increase in B-52 bombing activity necessitated the deployment of additional tankers.[4/]

In addition to its activity at Kadena, the 4252d Strategic Wing began utilizing Don Muang Airfield, Thailand, as a forward operating location early in 1965. Four KC-135s were deployed under the nickname TIGER CUB by the Wing at Don Muang. In September 1965, a second FOB was activated at Takhli AB, Thailand. This new operation, called the KING COBRA Tanker Task Force was begun with three aircraft and a cadre of support personnel. A steady buildup at Takhli followed. One additional aircraft arrived in October, two in November, and the full programmed strength of ten aircraft was reached in December 1965. With activation of the KING COBRA Task Force, nearly all of the tactical fighter refueling support was being provided from Thailand.[5/]

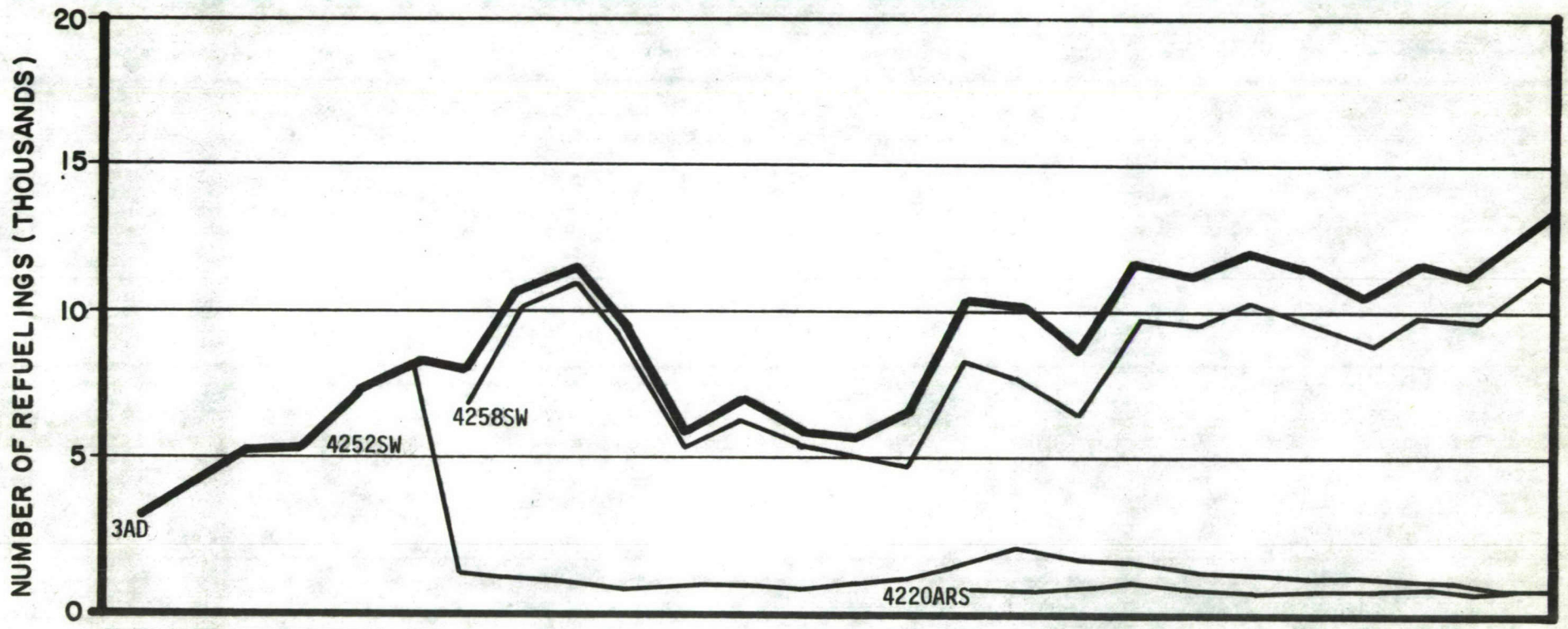
3D AIR DIVISION MONTHLY SORTIES FLOWN - KC-135



	1st	2D	3D	4th	1st	2D	3D	4th	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
4252 SW	1.1	1.1	1.2	1.4	1.7	1.8	1.0	.9	.7	.7	.6	.6	.6	.6	.7	1.0	1.2	.9	1.0	1.0	1.0	.9	1.0	.8	.7	.6
4258 SW							.9	1.3	1.4	1.3	1.1	1.3	1.1	1.0	1.3	1.2	1.3	1.1	1.5	1.6	1.6	1.6	1.4	1.5	1.4	1.6
4220 ARS																.2	.3	.4	.5	.4	.4	.6	.5	.6	.6	.6
3 ADIV	1.1	1.1	1.2	1.4	1.7	1.8	1.9	2.2	2.1	2.0	1.7	1.9	1.7	1.6	2.0	2.4	2.8	2.4	3.0	3.0	3.0	3.1	2.9	2.9	2.7	2.8
	MONTHLY AVERAGE								FISCAL YEAR 1968												FISCAL YEAR 1969					
	QTR/FY 66				QTR/FY 67																					

FIGURE 12

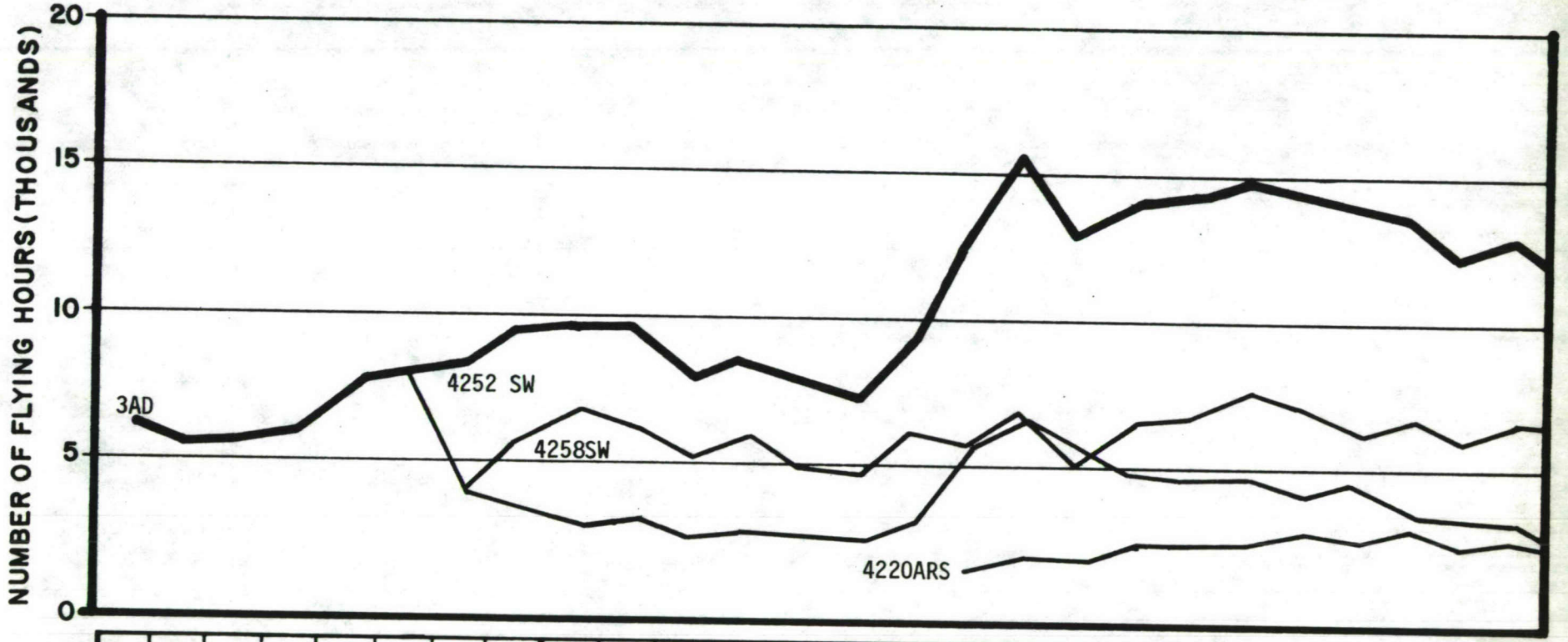
3D AIR DIVISION MONTHLY REFUELINGS ACCOMPLISHED - KC-135



	1st	2D	3D	4th	1st	2D	3D	4th	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
4252 SW	3.2	4.4	5.4	5.4	7.3	8.3	1.2	1.0	.9	.7	.8	.8	.7	.8	1.0	1.5	2.0	1.7	1.6	1.3	1.2	1.1	1.1	1.0	.9	.8
4258 SW							6.9	9.9	10.8	8.7	5.3	6.4	5.4	4.9	5.8	8.3	7.6	6.5	9.3	9.4	10.2	9.7	8.9	10.0	9.6	11.1
4220 ARS																.6	.6	.7	.8	.7	.6	.7	.6	.7	.8	.8
3 ADIV	3.2	4.4	5.4	5.4	7.3	8.3	8.1	10.9	11.7	9.4	6.1	7.2	6.1	5.7	6.8	10.4	10.2	8.9	11.7	11.4	12.0	11.5	10.6	11.7	11.3	12.7
	MONTHLY AVERAGE								FISCAL YEAR 1968												FISCAL YEAR 1969					
	QTR/FY 66				QTR/FY 67																					

FIGURE 13

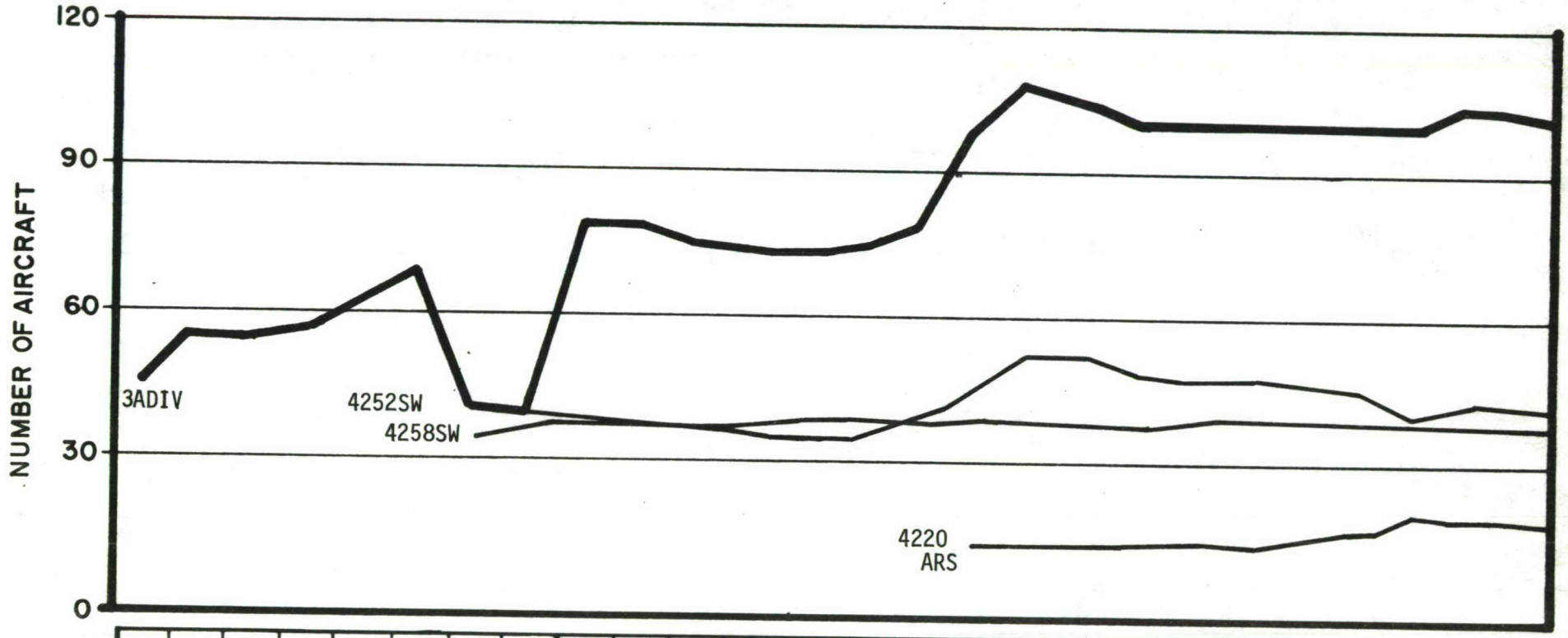
3D AIR DIVISION MONTHLY FLYING HOURS - KC-135



	1st	2D	3D	4th	1st	2D	3D	4th	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
4252 SW	6.5	5.8	5.9	6.2	7.7	8.1	4.0	3.7	3.1	3.3	2.7	2.8	2.7	2.6	3.1	5.5	6.6	5.9	4.9	4.8	4.9	4.3	4.7	3.8	3.5	3.4
4258 SW							4.3	5.9	6.8	6.4	5.3	6.0	5.2	4.8	6.3	5.7	6.9	5.1	6.7	6.9	7.5	7.1	6.5	6.8	6.2	6.7
4220ARS																1.6	2.1	2.0	2.5	2.5	2.5	3.1	2.8	3.1	2.7	2.9
3ADIV	6.5	5.8	5.9	6.2	7.7	8.1	8.3	9.6	9.9	9.7	8.0	8.8	7.9	7.4	9.4	12.8	15.6	13.0	14.1	14.2	14.9	14.5	14.0	13.7	12.4	13.0
	MONTHLY AVERAGE								FISCAL YEAR 1968												FISCAL YEAR 1969					
	QTR/FY 66				QTR/FY 67																					

FIGURE 14

3D AIR DIVISION MONTHLY AVERAGE ASSIGNED AIRCRAFT-KC-135



	1st	2D	3D	4th	1st	2D	3D	4th	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
4252 SW	46	56	55	57	63	70	42	40	40	40	40	35	35	35	39	44	53	53	49	48	48	47	46	41	43	43
4258 SW							35	38	39	39	36	39	39	40	39	40	40	39	39	40	40	40	40	40	40	40
4220ARS																15	15	14	15	15	15	16	17	21	21	21
3ADIV	46	56	55	57	63	70	77	78	79	79	76	74	74	75	78	99	108	106	103	103	103	103	103	102	104	104
	MONTHLY AVERAGE								FISCAL YEAR 1968												FISCAL YEAR 1969					
	QTR/FY 66				QTR/FY 67																					

FIGURE 15

At the end of 1965, the tankers were distributed as follows: Kadena AB, 40 (ARC LIGHT and YOUNG TIGER); Takhli AB, 10; Don Muang AB, 4; and Andersen AFB, 1 (Strip Alert). On 2 June 1966, a second tanker wing, the 4258th Strategic Wing, was activated at U-Tapao AB, Thailand. This new Wing would eventually take over the PACAF refueling commitment, while the 4252d would support the ARC LIGHT effort.[6/] Initially, however, the U-Tapao functioned as an FOB and the 4252d was assigned the operational control of all KC-135 forces in SEA, until such time as the 4258th reached MOB status.[7/]

The tanker buildup at U-Tapao started on 8 August 1966. Twelve aircraft, ten primary and two spares, were in place by 14 August. By October, 23 aircraft (including two COMBAT LIGHTNING EC-135s) were postured at U-Tapao, and the task force at Don Muang was closed. At the end of 1966, the ARC LIGHT/YOUNG TIGER tanker force totaled 75 aircraft. Tanker distribution was: Kadena, 46; U-Tapao, 21; and Takhli, 8.[8/]

On 1 February 1967, the 4258th at U-Tapao reached full KC-135 MOB capability and assumed complete responsibility for the YOUNG TIGER commitment, with tankers at other bases filling in as required. By relocating the PACAF refueling operation to Thailand, two important objectives were attained: (1) The 4252d Strategic Wing's ability to limit its activity to the growing needs of the ARC LIGHT forces exclusively; and (2) shorter and more frequent sorties to support 7AF aircraft.[9/] Tanker operations at Takhli ended in 1968, and the force at U-Tapao grew to 40 aircraft.[10/]

With the substantial increase in ARC LIGHT operations and the additional

activity associated with the post-Pueblo USAF posture in Korea, Japan, and Okinawa, greater demands were placed on the air-to-air refueling capability. The total force posture grew to 108 aircraft, and a new tanker location was activated at Ching Chuan Kang AB, Taiwan. While the posture had doubled, 3d Air Division tanker activities had almost tripled since 1965.[11] (Fig. 16.)

Within this revised posture, the EC-135 COMBAT LIGHTNING mission and aircraft were transferred from U-Tapao to Ching Chuan Kang. The primary mission of the tanker force at Kadena and Ching Chuan Kang was ARC LIGHT refueling support, while PACAF refueling requirements mostly outside SEA, were also supported. U-Tapao's YOUNG TIGER force retained its commitment to support 7AF tactical fighter operations.[12]

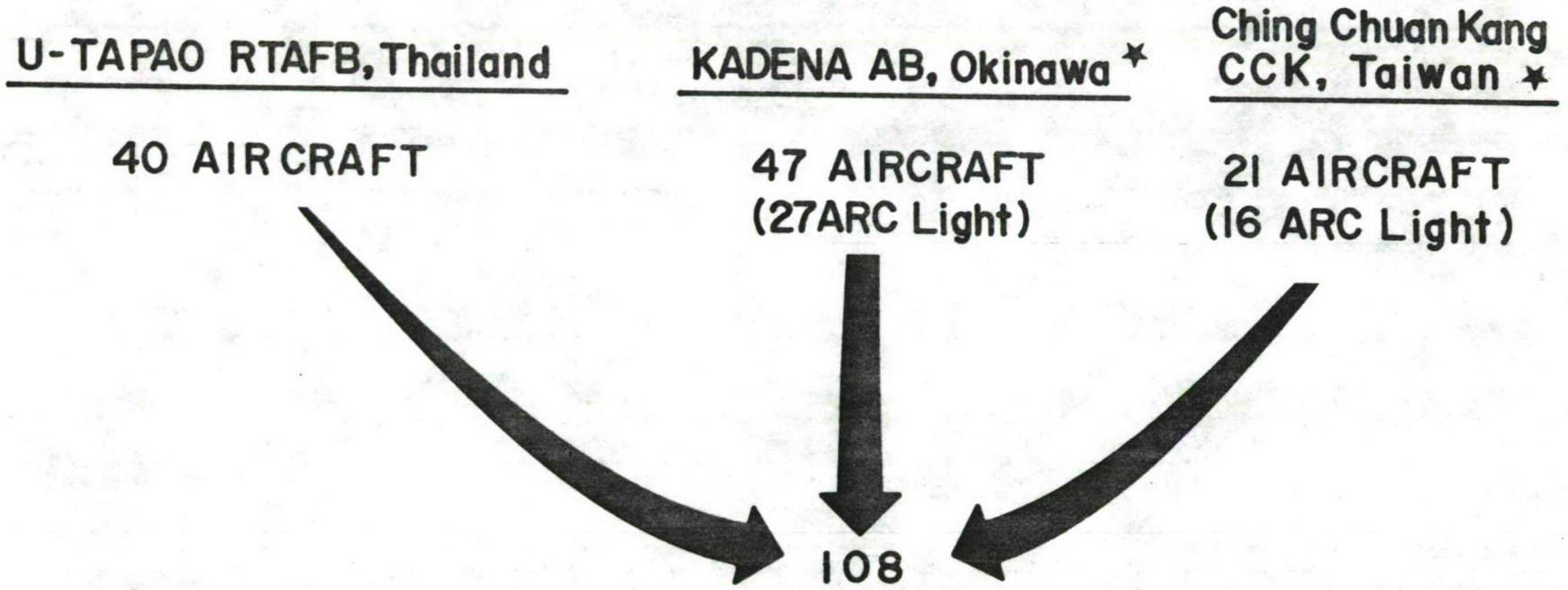
YOUNG TIGER Control, Coordination, and Utilization

From the first operational mission flown from Kadena AB on 25 January 1965, the YOUNG TIGER force grew from an original complement of 15 tankers to 40. Originally assigned to the 4252d Strategic Wing at Kadena, the YOUNG TIGER posture expanded to partial operations at Don Muang AB and Takhli AB in Thailand, and then to full operations at U-Tapao AB, Thailand. At this point, they were assigned to the 4258th Strategic Wing.[13]

When first tasked to support 7AF operations, the YOUNG TIGER commitment was primarily associated with air operations against North Vietnam. After air operations against North Vietnam ceased, the largest part of the daily refueling commitment was to F-4 and F-105 forces conducting strikes in Laos and South Vietnam. Other missions supported included RF-4C and RF-101 reconnaissance missions, EB-66 electronic warfare missions, and F-100 MISTY FAC operations.[14] (Fig. 17.) An alert aircraft was also maintained for support

SECRET

3D AIR DIVISION
KC-135 FORCE BREAKOUT



★ ARC LIGHT
NOTE: And 2 STRIP ALERT

FIGURE 16

SECRET

SOURCE: 3AD (DOPL)
March 1969

YOUNG TIGER

DAILY COMMITMENT (54) SORTIES

NORMAL FRAG REQUIREMENT	SORTIES	SUPPORTING
STRIKE FORCES	36	F-4C AND F-105 STRIKES SVN & LAOS FLAK/SAM SUPPRESSION.
RECONNAISANCE	7	RF-4C AND RF-101 MISSIONS SVN AND LAOS.
ELECTRONIC WARFARE	5	EB-66 ECM AIRCRAFT.
FAC	5	F-100 FAC AIRCRAFT IN SVN AND LAOS.
TAC	1	AIR OPERATION IN DELTA SVN.

FIGURE 17

of RESCAP operations.[15/]

As stated in the last chapter, a SAC Liaison Office was established at Tan Son Nhut AB in March 1965 for the primary purpose of coordinating YOUNG TIGER tanker operations with 7AF. In January 1967, SACLO was redesignated the SAC ADVON, received additional personnel, and assumed major ARC LIGHT planning and coordination responsibilities in addition to the tanker responsibilities.

Control procedures for YOUNG TIGER operations were considerably different from those established for the ARC LIGHT program. ARC LIGHT missions were fragged and executed by the 3d Air Division; the YOUNG TIGER tanker force was fragged by SAC ADVON, and missions were executed by 7AF. After 7AF prepared its fighter frag order and transmitted it to fighter units and GCI sites, SAC ADVON prepared a tanker frag from this information and transmitted it to the 4258th and the GCI sites.[16/]

Tanker Operations at U-Tapao prepared mission data for the crews and published a schedule based on the tanker frag. This information was furnished to the Command Post prior to each day's flying. Tanker sorties were executed by the 7AF Command Post (BLUE CHIP) by telephone to the 4258th Command Post and Tanker Operations. Crews received execution at the pre-takeoff briefing or by radio from the Command Post, if the execution were not available at briefing time.[17/]

With a complement of 40 tankers, the YOUNG TIGER sortie commitment was 1,620 monthly--54 daily. The sortie rate of 54 sorties per day was determined by using 1.5 times the available 40 aircraft and multiplying by 90 percent

reliability. A crew strength of 68 crews was determined by dividing the number of monthly flying hours by 100 hours per crew. Crews were on a 58-day TDY status. They were available to the Wing for about 53 days and averaged 40 sorties during their tour.[18/]

Fourteen air refueling areas had been established for YOUNG TIGER operations. Nine areas were located in Thailand and Laos, three in South Vietnam (one coastal), and two areas in the Gulf of Tonkin. Seven areas had an orbit and an Anchor orbit connected by a track. Both Anchor orbits in the Gulf of Tonkin were used for post-strike refueling, whereas four of the Thailand-Laos refueling areas had extended tracks from the Anchor orbit Aerial Refueling Control Point (ARCP) to the northern/refueling limits.[19/] (Figs. 18, 19.)

Tanker support of strike forces was normally divided to provide 17 tankers for the morning strike force, 15 tankers for the afternoon strike force, and 4 tankers for nighttime strikes. Maximum utilization of the tankers was attained in support of the two main strike forces, as they normally consisted of flights of four fighters in a concentrated period. The night operations, reconnaissance, and electronic warfare (EW) sorties were normally individual aircraft missions spread over a greater time period.[20/]

The 17 tankers in the morning package supported approximately 80 fighters. The morning strike package normally refueled in four areas:[21/]

. Cherry Anchor was used to support strikes in the TIGER HOUND and STEEL TIGER areas in Southern Laos and strikes into the lower Route Packages of North Vietnam. These receivers were generally all strike aircraft.

TYPICAL AIR REFUELING AREA/ARCPS/TRACKS

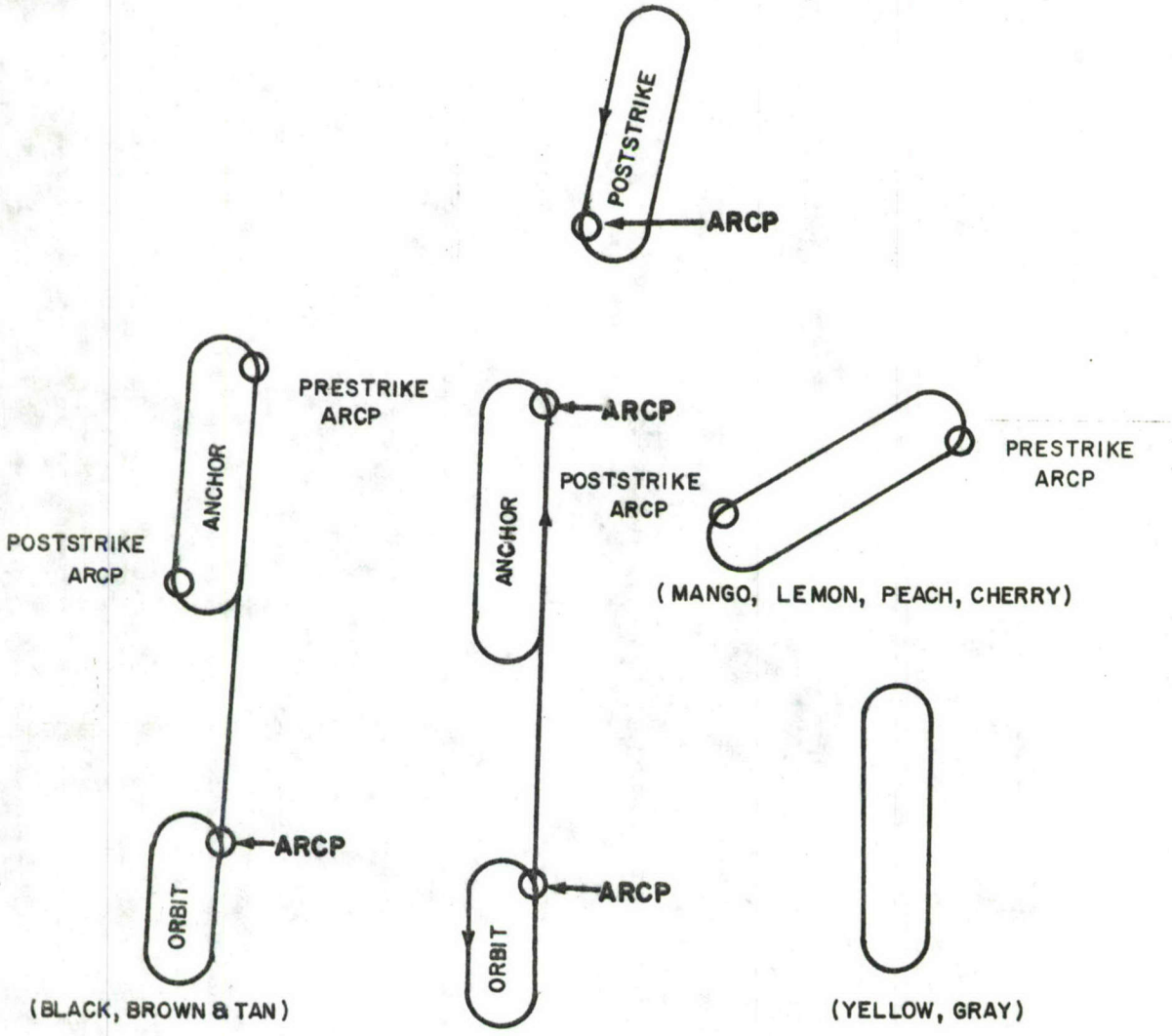


FIGURE 18

REFUELING TRACKS

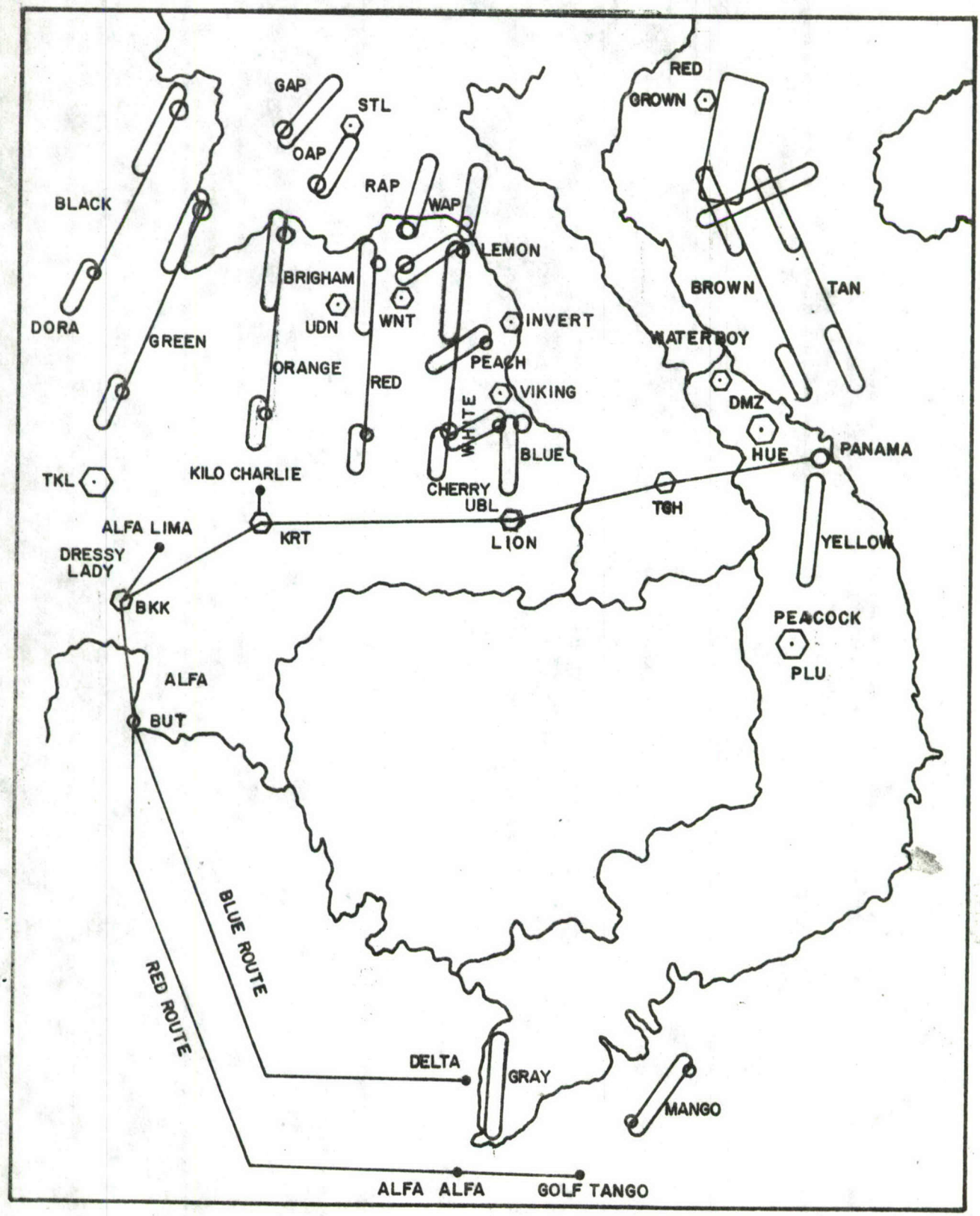


FIGURE 19

- Lemon Anchor was used to refuel strikes in the BARREL ROLL area of Northern Laos and into North Vietnam.
- Peach Anchor was used mainly to refuel Flak and SAM suppression sorties (IRON HAND) into North Vietnam, and reconnaissance missions. The IRON HAND missions were generally in flights of two receivers.
- Yellow Anchor was used to support F-4s from South Vietnam striking in the area of the DMZ. These were generally in flights of two aircraft.

The afternoon strike package was similar to the morning strike, with the main force being cells of four requiring a pre-strike and a post-strike refueling. Night strikes were supported by four tankers in Cherry and Yellow Anchors. In Cherry, there were generally single receivers spaced 15 minutes apart over two hours on station. In Yellow, the F-4s were refueled in two aircraft cells about 30 minutes apart.[22/]

Throughout the entire day, there were reconnaissance, ECM, and other miscellaneous sorties refueled in Peach and Yellow Anchors. These were generally single aircraft supported by a tanker on station for approximately two hours. Seven tankers were used to support these missions. When the scheduled tanker offload was small, this type of activity was generally at a low point and few receivers were airborne.[23/]

Five tankers were used to support EB-66 activities from refueling areas in the Gulf of Tonkin. These aircraft were giving EW support to the reconnaissance drones over North Vietnam. To support the F-100 Forward Air Controllers in the DMZ area, five tankers were used to maintain an on-station capability for nearly 12 hours daily. The FACs departed the strike area as they needed fuel, refueled, and returned to the area. Tankers normally gave two to four

refuelings during their period on-station.[24/]

Specific fighter strike options required the assembly of mass tanker/fighter formations at a specific geographical point at predetermined times. The tanker force, operating as two or three independent cells on the same track, would rendezvous at the completion of pre-strike refueling for force assembly. Timing requirements had to be met. Two strike forces could refuel on adjacent tracks and their assembly into a combined strike force prior to target area entry was based on the tanker forces making good the drop off point and drop off time. Approximately 25 minutes was required to launch an entire strike force. This was due to ordnance arming requirements just prior to takeoff. The last flight of fighters would be the only receivers to make good the Aerial Refueling Control Time (ARCT). All other receivers would arrive in the refueling area five to twenty-five minutes before the control time. Therefore, rendezvous with the receiver flights could begin prior to tanker arrival at the ARCP. Effective tanker timing and cell join up were essential to insure the success of the strike force.[25/]

The density of air operations in Southeast Asia dictated the need for standard, simplified procedures between aircrews and Tactical Air Control System (TACS) controllers. These procedures were based on GCI maintaining rendezvous control through coordination of tanker and receiver aircraft with the aid of ground and airborne navigational resources. Pre-strike refueling was conducted within TACS radar coverage. Post-strike refueling could be initiated beyond TACS radar coverage, but would be completed under TACS control.[26/]

All tankers were required to remain under the control of GCI throughout

KC-135s at U-Tapao

Figure 20

the mission while on tactical flight plan. All altitude changes required GCI approval except in an emergency. As the various GCI sites had the tanker and fighter fragmentary orders, they were aware of mission requirements and assignments. Additionally, GCI had direct lines to the 7AF Command Post and, consequently, changes in mission requirements generated by 7AF were passed directly to the aircrew through GCI. The planned en route cruise airspeed was 450 KTAS. Missions flown at altitudes which precluded accelerating to 450 KTAS were planned to fly at an airspeed that would meet required timing. En route cell formation was flown with the aircraft one nautical mile in trail and 500 feet vertical separation.[27/]

The importance of standardized control procedures in the air refueling process was well-demonstrated by an emergency refueling incident that occurred on 11 August 1966. An F-4C of the 8th Tactical Fighter Wing, which had been hit during a strike mission over Kep Airfield in North Vietnan, was losing fuel and radioed for tanker assistance. Three communications stations got on the guard emergency communication channel and attempted to direct the tanker and fighter together for a hookup. As a result, the KC-135 could not get a directional fix on the fighter and the majority of the communications received was garbled.[28/]

After much maneuvering around the entire spectrum of airspace assigned, the tanker and fighter found each other. By that time, it was too late. The F-4 missed its first approach, and in attempting to make the hookup on the second approach, it flamed out only a few feet from the refueling probe due to fuel exhaustion. The crew ejected successfully and both were picked up uninjured

by a Navy helicopter. Subsequent review indicated that the incident could have been prevented, had not three ground-controlled intercept stations been on the air at the same time. In addition to garbled communications, it was found that the wrong intercept direction was given to the tanker crew. The GCI station gave an intercept point in the wrong direction. It headed the tanker north, when the fighter was actually 30 miles south.[29]

The foregoing incident was far from typical. Records of YOUNG TIGER refueling operations show them to be extremely well-coordinated and successful; as an integral part of the total tactical air effort in SEA, they have provided the 7AF Commander with the flexibility needed to "make adjustments to a daily changing tactical situation." In his words, the employment of forces "has been materially improved by their sustained high level of performance."[30] Daily operations have been a tightly cohesive effort between schedulers, tankers, receivers, and controllers.

As of 27 September 1968, the YOUNG TIGER KC-135s were credited with 81 aircraft "saves", i.e., 81 aircraft which were dangerously low on fuel, or had taken hits and could not have returned safely to their base without air refueling.[31] One example:[32]

> *"MISTY 21 /F-100 FAC/ was working WATERBOY /GCI/ control for vectors to BRA 15P /Tanker/. He was vectored in and MISTY 21 indicated to WATERBOY he was low on fuel. Head-on type rendezvous was effected with MISTY 21 making a 180° turn to get behind tanker coming in. MISTY 21 indicated problem with forward body tank. MISTY 21 called BRA 15P to push it up. Shortly thereafter, he requested us to slow down. We were at 315 KTAS. Tanker slowed down to 300 KTAS. MISTY 21 became*

F-4s Prestrike Refueling

Figure 21

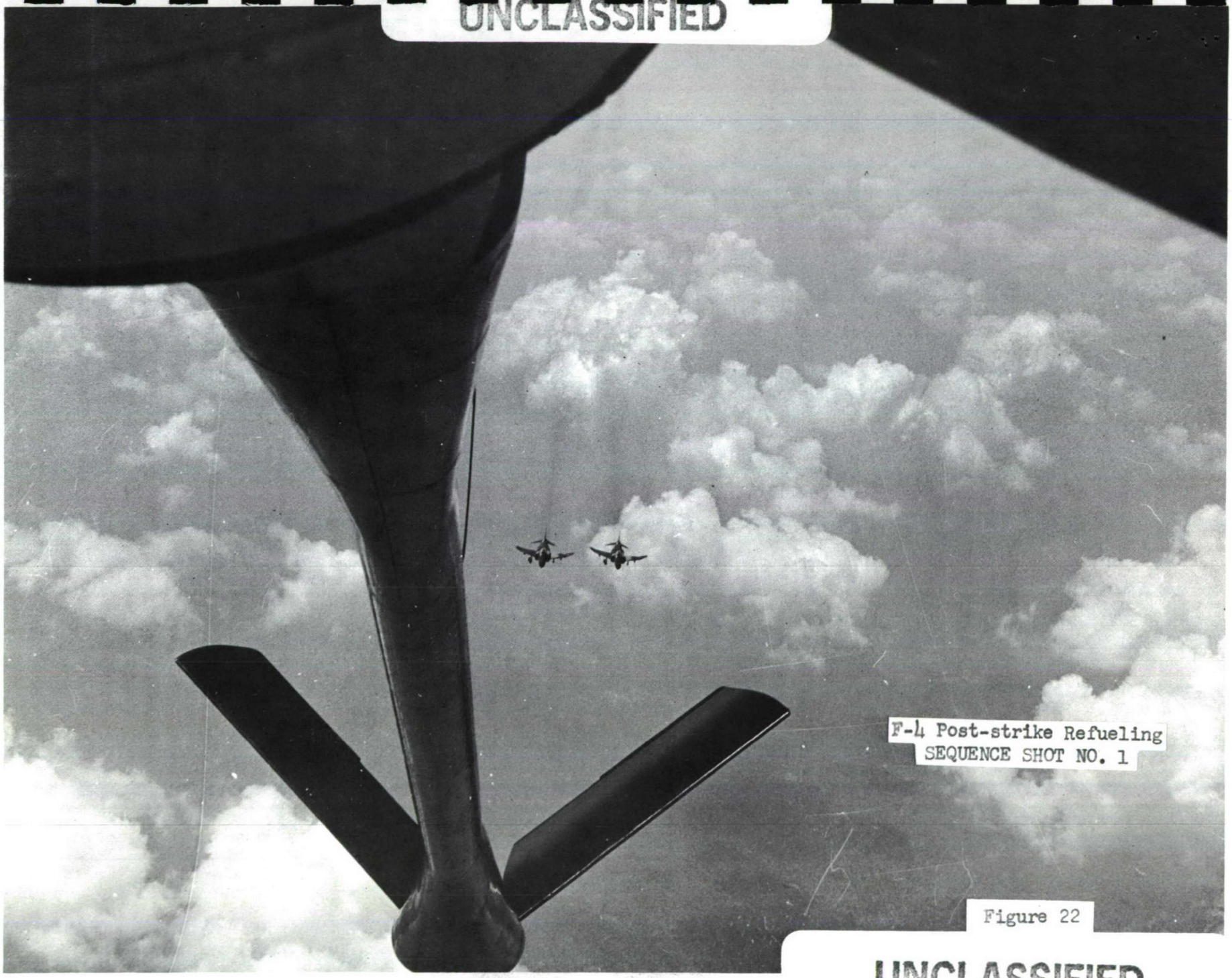
quite excited and said, 'Please slow it down. Please slow it down. I'm about to flame out.' Tanker pulled speed boards slightly and retarded throttles while requesting what airspeed MISTY 21 desired. MISTY 21 said, 'I'm having trouble. It looks like I'm going to have to leave this....' BRA 15P disengaged the auto pilot and started to descend to keep ahead of MISTY 21. Finally MISTY 21 indicated he wanted 275-280 KTAS. During this time, the boom was trying to keep BRA 15P ahead of MISTY 21 by relaying his position. BRA 15P slowed to 275 and descended to keep ahead. MISTY 21 undershot BRA 15P twice in attempting to get contact. MISTY 21 requested we head toward Da Nang. CP and Navigator coordinated with WATERBOY to head toward Da Nang while attempting contact. During the descent, MISTY 21 mentioned flame-out....Finally contact was made at 11,000-12,000 feet. Fuel was transferred and descent continued to 7,000 feet. 8,200 lbs. of fuel were transferred and MISTY 21 seemed to get things under control. He said he could make it back O.K. and so we terminated the emergency air refueling 22 miles northeast of Da Nang. BRA 15P returned to primary area to complete mission. We were later informed that MISTY 21 had landed safely at Da Nang."

Between August 1966, when operations began at U-Tapao, and 28 February 1969, the Thailand-based tankers flew 36,117 sorties of 43,001 sorties scheduled. The force had flown 257,161 hours and offloaded 1,510,152,900 pounds of fuel. They had accomplished more than 208,500 air refuelings.[33/] A 17 January 1968 message from Gen. William W. Momyer to Gen. John D. Ryan, the former SAC Commander, who became Commander-in-Chief, Pacific Air Forces, provides insight into the added capability provided him by YOUNG TIGER operations at that time:[34/]

"Tanker support for operations in Laos is largely dependent upon the force structure committed to the Alpha Day package. When Ubon F-4s are committed as a strike force in RP VIA, approximately 18 F-105 sorties from Korat or Takhli are available for strikes in Laos. This requires two tankers to support Laotian strikes. If Ubon is not committed as a strike force in RP VIA, these sorties are fragged against Laotian or RP I targets. Due to location, no tanker support is required. An overall average tanker requirement for Laotian operations

would be one tanker daily. Present tanker requirements for MUSCLE SHOALS operations run 20 to 25 tanker sorties a month. When the Navy OP-2 flies into a known high threat area, a flight of F-4s from Da Nang rendezvous with the OP-2. The primary mission is to suppress ground fire when required. The F-4s pre-strike refuel from the tanker prior to rendezvous with the OP-2. After withdrawing from high threat area, the F-4s post-strike refuel and strike an assigned target if ordnance is not expended on primary mission.

"...TACC's requirement for 12 fighters and 3 tanker sorties daily is for MISTY FACs. Currently, I am using 1 to 2 tanker sorties daily to support the MISTY FACs; however, the programmed increase in F-100 strength will require 3 tanker sorties daily. Yellow track is now authorized for use 24 hours a day. With this additional capability, TACC has a requirement for two additional tankers daily to refuel 14 F-4s. Offloads would be 5,000 lbs. each aircraft. These sorties are normally spread out over a 16-hour period, but can be compressed to a time period that two tankers could support. With the additional loiter time resulting from air-to-air refueling, the fighters can be more effectively utilized...."



F-4 Post-strike Refueling
SEQUENCE SHOT NO. 1

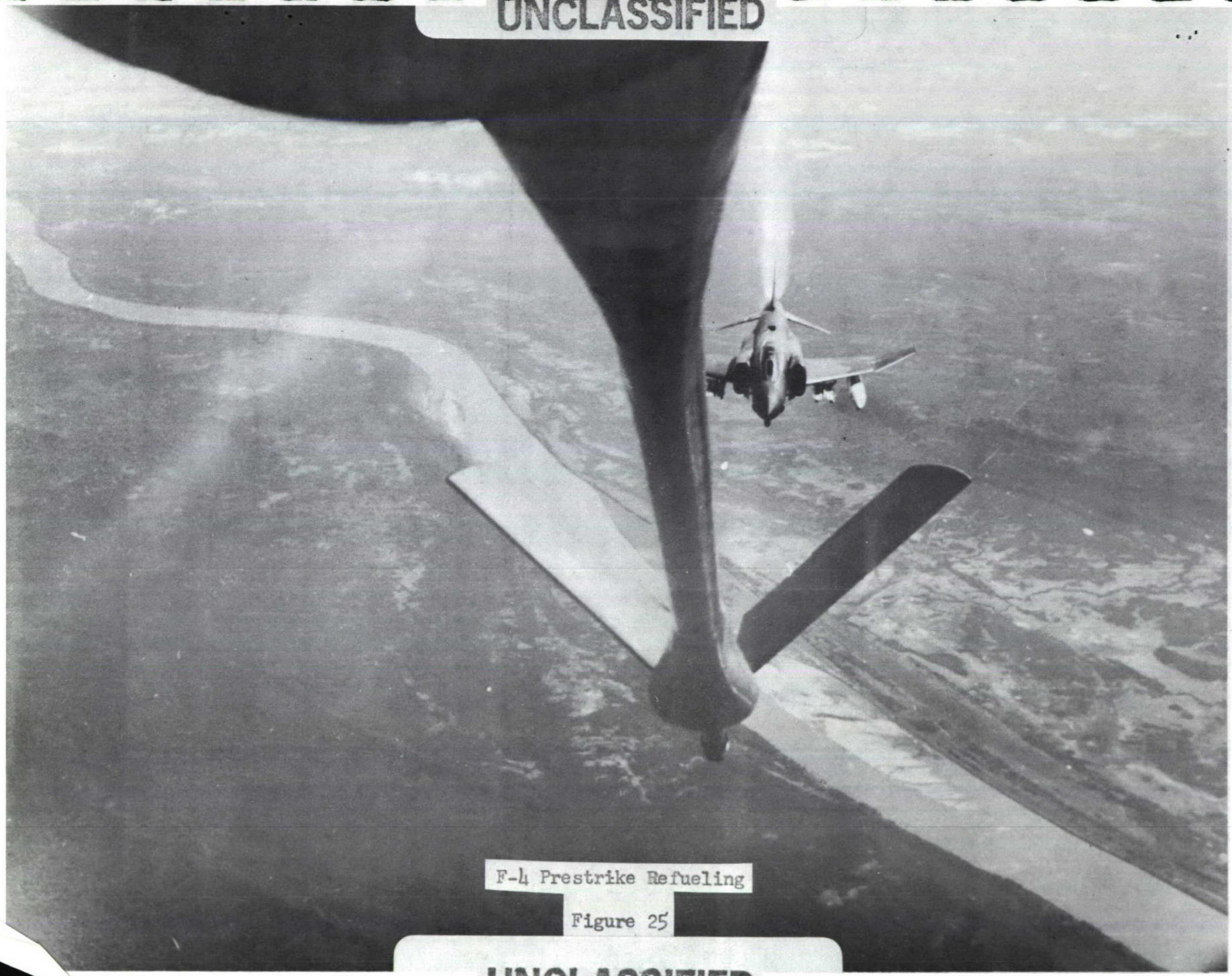
Figure 22

F-4 Post-strike Refueling
SEQUENCE SHOT NO. 2

Figure 23

F-4 Post-strike Refueling
SEQUENCE SHOT NO. 3

Figure 24



F-4 Prestrike Refueling

Figure 25

F-100 MISTY FAC Refueling

Figure 26

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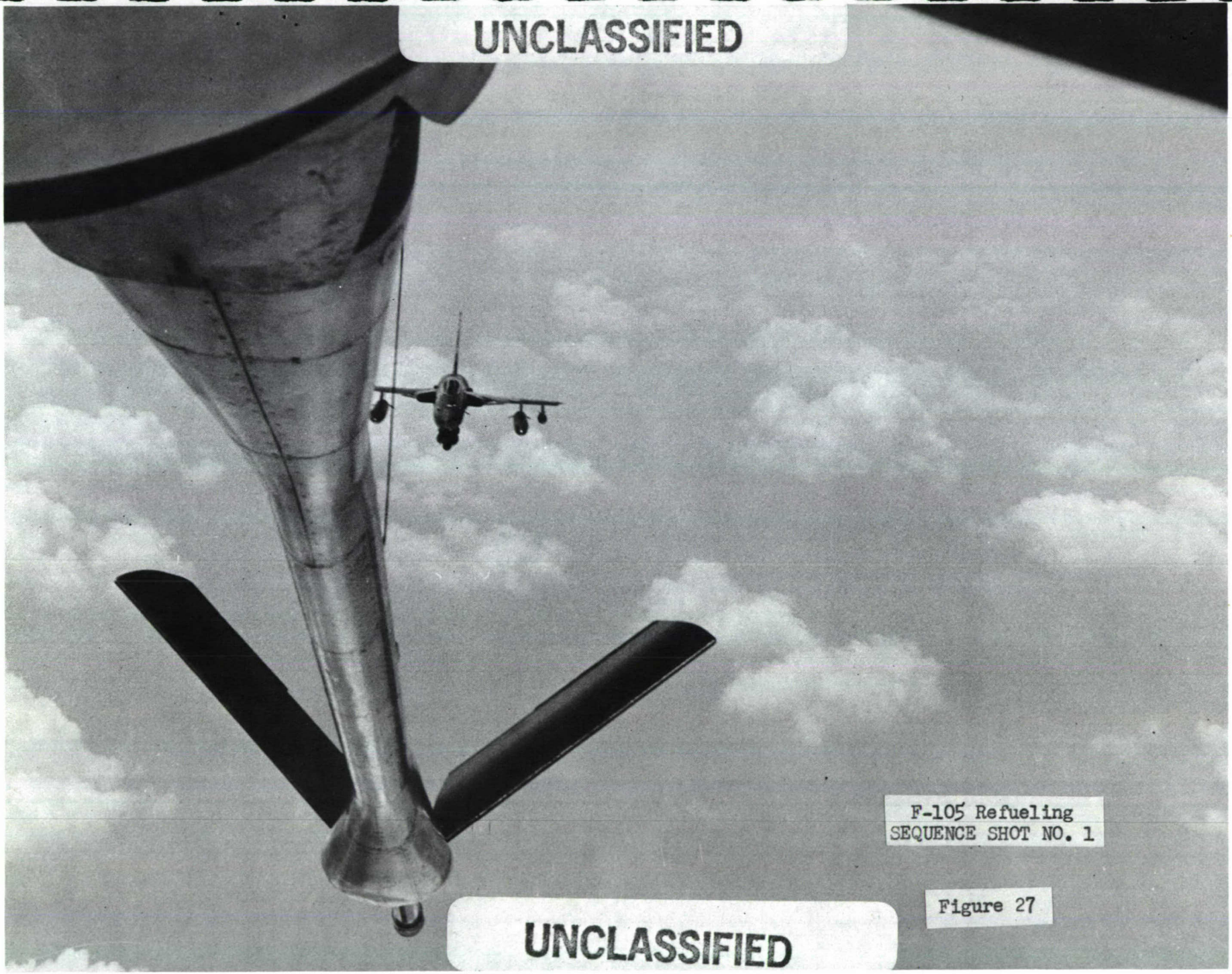
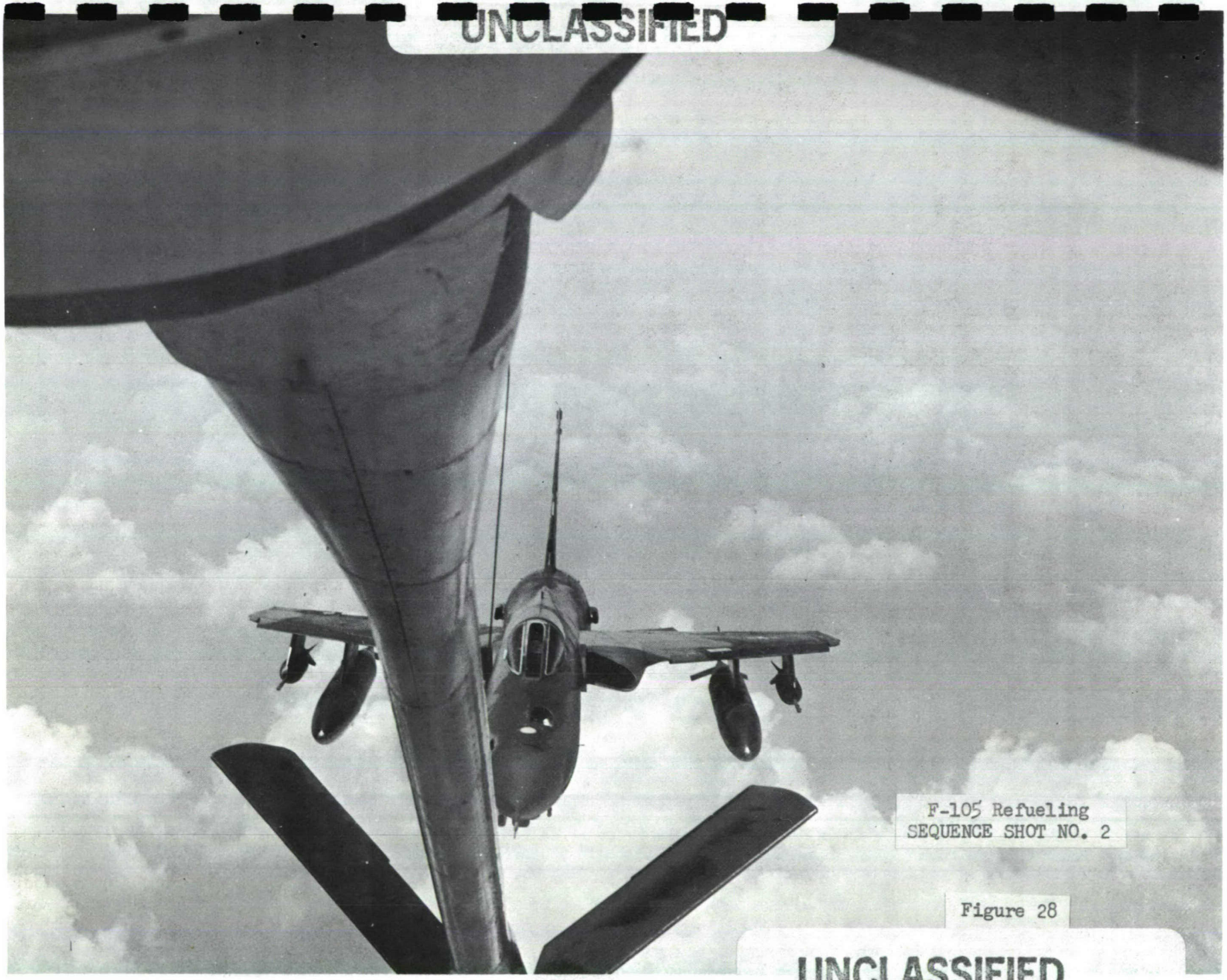


F-105 Refueling
SEQUENCE SHOT NO. 1

Figure 27

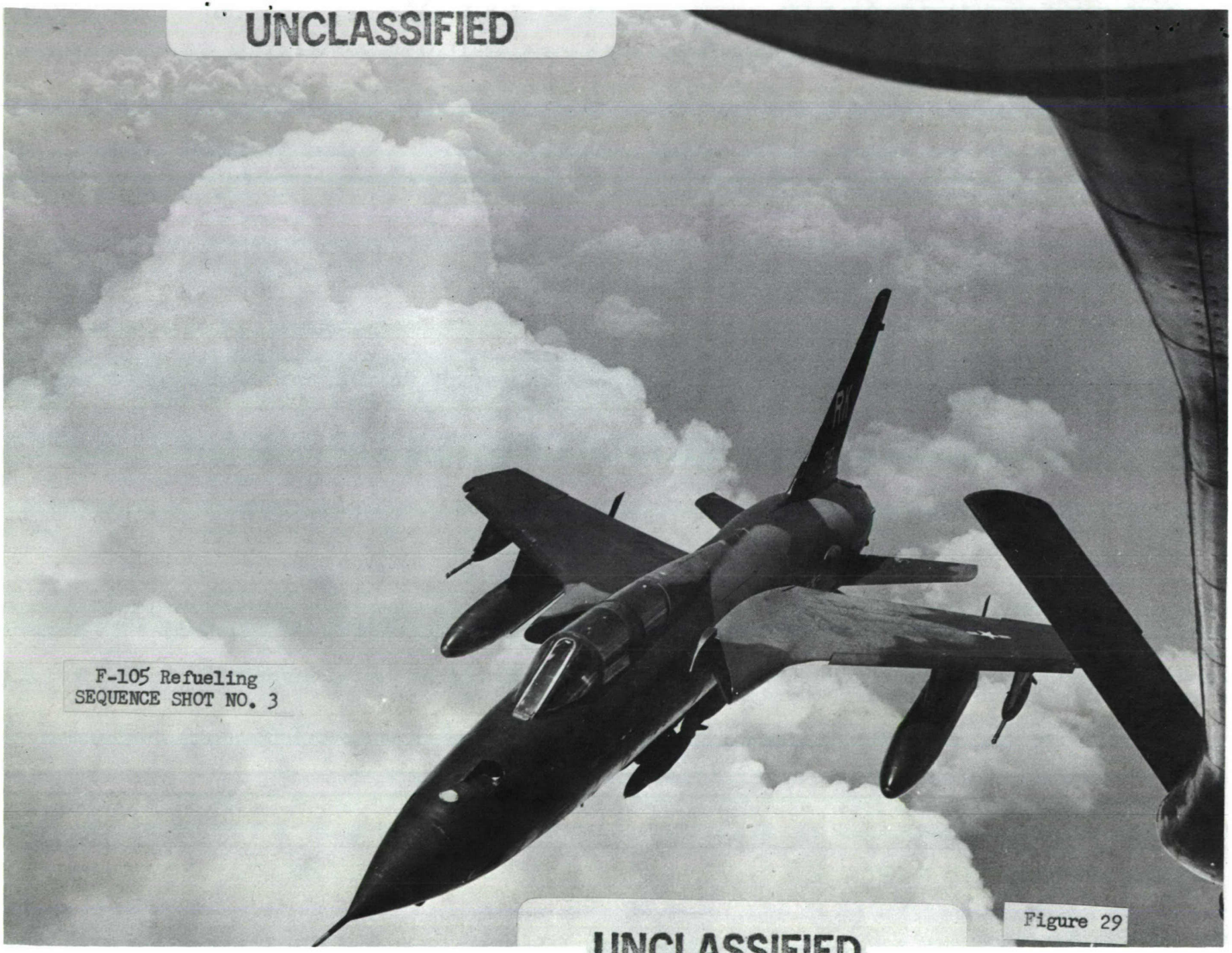
UNCLASSIFIED



F-105 Refueling
SEQUENCE SHOT NO. 2

Figure 28

UNCLASSIFIED



F-105 Refueling
SEQUENCE SHOT NO. 3

Figure 29

UNCLASSIFIED

FOOTNOTES

CHAPTER I

1. (TS/SPECAT/AFEO) Msg, CINCSAC to CSAF, subj: ARC LIGHT Sortie Rates, 181441Z Oct 68.

2. (S/NF) Hist Rprts, 3d Air Div, 1965-1968;
(TS/NF/AFEO) CHECO Rprt, Hq PACAF, DOTEC, "ARC LIGHT, 1965-1966," 15 Sep 67. (Hereafter cited: "ARC LIGHT, 1965-1966.")
(TS/AFEO) CHECO Rprt, Hq PACAF, DOTEC, "ARC LIGHT, Jan-Jun 1967," 22 Mar 68. (Hereafter cited: "ARC LIGHT, Jan-Jun 1967.")

3. Ibid.

4. Ibid.

5. Ibid.

6. (S/NF) Interview, Col K. E. Wehrman, SAC ADVON Comdr, with Robert R. Kritt, PhD, Historian, 3d Air Div, 16 Nov 68. (Hereafter cited: Interview with Colonel Wehrman.)

7. (S) Rprt, Combat Analysis Group and Strategic Ops Div, Ops Dir (J-3) OJCS and Defense Intel Agency, "Review and Appraisal of ARC LIGHT Operations," 23 May 68. (Hereafter cited: "Review and Appraisal of ARC LIGHT Operations.")

8. Ibid.

9. Ibid.

10. (S) Msg, JCS to CINCPAC, subj: SAC B-52 Planning ADVON, 211713Z Dec 66.

11. (U) Ltr, Comdr, 3d Air Div, to SAC Liaison Officer, 2d Air Div, subj: Responsibilities of SAC Liaison Officer 2d Air Div, RVN, 25 Aug 65.

12. Ibid.

13. (S) Ltr, Maj Gen Alvan C. Gillem II, DCS/O, SAC to Col. A Schneider, SAC ADVON Comdr, subj: SAC ADVON Team, 23 Dec 66.

14. Ibid.

15. (S/NF) Interview with Colonel Wehrman.

16. Ibid.

17. Ibid.

18. Ibid.

19. Ibid.

20. (C) Briefing, 3d Air Div, DOPL, Mar 69.

21. Ibid.

22. (S/NF) Hist Rprts, 3d Air Div, 1965-1968;
(TS) "ARC LIGHT, 1965-1966";
(TS) "ARC LIGHT, Jan-Jun 1967."

23. (S/NF) Interview, Lt Col Donald Evans, Chief, 3AD, DOPL, with Robert R. Kritt, PhD, Historian, 3d Air Div. (Hereafter cited: Interview with Lt Colonel Evans.)

24. Ibid.

25. (S) Review and Appraisal, 3d Air Div, ARC LIGHT Operations.

26. (S/NF) Interview with Lt Colonel Evans.

27. (TS/SPECAT/AFEO) Msg, CINCSAC to CSAF, subj: ARC LIGHT Sortie Rates, 181441Z Oct 68.

28. (TS/NF/AFEO) "ARC LIGHT, 1965-1966," pg 14.

29. (C) Statistical Data Rprt, Hq 3d Air Div, DCRM, undated.

30. (C) Msg, SAC to SecDef, OASD, subj: Request for Approval to Update Figures on SAC's Operations in SEA, 132151Z Dec 68.

31. (TS/SPECAT/AFEO) Msg, CINCSAC to CSAF, subj: ARC LIGHT Sortie Rates, 181441Z Oct 68.

32. Ibid.

33. Ibid.

34. Ibid.

35. (TS/SPECAT/AFEO) Msg, AFSSO, 7AF to AFSSO, PACAF, Personal for Gen Nazarro fm Gen Brown, subj: ARC LIGHT, 061105Z Nov 68.

36. (S) Msg, CINCPAC to JCS, subj: ARC LIGHT Sortie Rate, 191152Z Oct 68.

37. Ibid.

38. Ibid.

39. Ibid.

40. Ibid.

41. Ibid.

42. Ibid.

43. (S/NF) Statistical Files, Hq PACAF, DOTEC;
(S/NF) Statistical Data Rprt, Hq 3d Air Div, DCRM.

44. (TS/NF/AFEO) "ARC LIGHT, 1965-1966";
(TS/AFEO) "ARC LIGHT, Jan-Jun 1967."

45. (S) Ltr, Hq SAC, DO, and Others, subj: Info/Action Items, 21 Nov 67.

46. (S) Ltr, Maj Gen Alvan C. Gillem,II, SAC, DCS/O to Maj Gen Crumm, 3d Air Div Comdr, 27 Feb 67.

47. (C) Statistical Data Rprt, Hq 3d Air Div, DCRM;
(TS/NF/AFEO) "ARC LIGHT, 1965-1966";
(TS/AFEO) "ARC LIGHT, Jan-Jun 1967.

48. (S) Hist Rprt, 3d Air Div, Jan-Jun 65, Vol I, pg 4.

49. Ibid, pp 22-23.

50. Ibid, pg 24.

51. (C) Statistical Data Rprt, Hq 3d Air Div, DCRM.

52. Ibid.

53. (TS/NF/AFEO) "ARC LIGHT, 1965-1966";
(TS/AFEO) "ARC LIGHT, Jan-Jun 1967."

54. (S/AFEO) Hist Rprt, 3d Air Div, Jul-Dec 66, Vol IA.

55. Ibid, pp 127-128.

56. (S/NF) HIst Rprt, 3d Air Div, Jan-Jun 67, pp 89-92.

57. Ibid, pp 127-128.

58. (TS/NF/AFEO) "ARC LIGHT, 1965-1966";
(TS/AFEO) "ARC LIGHT, Jan-Jun 1967."

59. (S/NF) Hist Rprt, 3d Air Div, Jul-Dec 67, pg 42;
(S/NF) Hist Rprt, 3d Air Div, Jan-Jun 68.

60. (S/NF) Hist Rprt, 3d Air Div, Jan-Jun 68.

61. Ibid.

62. Ibid.

63. Ibid;
(C) Statistical Data Rprt, Hq 3d Air Div, DCRM.

64. (S/NF) Hist Rprt, 3d Air Div, Jan-Jun 68.

65. (S) Review and Appraisal, 3d Air Div, ARC LIGHT Operations.

66. Ibid.

67. (S/NF) Report, "ARC LIGHT Follow-on Study, Preliminary Planning Conference Report, 20 Sep 68. (Hereafter cited: "ARC LIGHT Follow-on Study.")

68. Ibid.

69. (S/NF) Hist Rprt, 3d Air Div, Jan-Jun 68.

70. (S) Msg, Lt Gen Alvan C. Gillem, II, Comdr, 3AD to Hq SAC, subj: ARC LIGHT Sortie Rate, 20 Jun 68.

71. Ibid.

72. (S) Review and Appraisal, 3d Air Div, ARC LIGHT Operations.

73. (S/NF) "ARC LIGHT Follow-on Study."

74. (S) Msg, SAC to 3AD, subj: Munitions Expenditure Rates, 031521Z Oct 68.

75. (S) Review and Appraisal, 3d Air Div, ARC LIGHT Operations.

76. Ibid.

77. (S) Briefing, 3d Air Div, DOPL, Mar 69.

78. Ibid.

79. Ibid.

80. (S) Review and Appraisal, 3d Air Div, ARC LIGHT Operations.

81. (S) Speech, COMUSMACV, Gen. Creighton Abrams, Jr., to 4258th SW Aircrews at U-Tapao AB, Thailand, 28 Jan 69.

82. Ibid.

83. (S) Review and Appraisal 3d Air Div, ARC LIGHT Operations.

84. (S/NF) Hist Rprt, 3d Air Div, Jan-Jun 67;
(S/NF) Hist Rprt, 3d Air Div, Jul-Dec 67;
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GLOSSARY

AB	Air Base
ADVON	Advanced Echelon
AFB	Air Force Base
ARCP	Aerial Refueling Control Point
ARCT	Aerial Refueling Control Time
ARVN	Army of Republic of Vietnam
BDA	Bomb Damage Assessment
CAP	Combat Air Patrol
CEP	Circular Error Probable
CICV	Combined Intelligence Center, Vietnam
CINCPAC	Commander-in-Chief, Pacific Command
CINCSAC	Commander-in-Chief, Strategic Air Command
COC	Combat Operations Center
COMUSMACV	Commander, U.S. Military Assistance Command, Vietnam
CONUS	Continental United States
DASK	Drift Angle Station Keeping
DCS/O	Deputy Chief of Staff, Operations
DMZ	Demilitarized Zone
DOPL	Directorate of Operations Plans
DPI	Designated Point of Impact
ECM	Electronic Countermeasures
ELINT	Electronic Intelligence
EW	Electronic Warfare
FAC	Forward Air Controller
FFV	Field Force Vietnam
FOB	Forward Operating Base
GCI	Ground-Controlled Intercept
GDF	Ground Diverted Force
IDC	Inflight Diverted Cell
IDF	Inflight Diverted Force
IP	Initial Point
JCS	Joint Chiefs of Staff
JEBM	Jet Engine Basic Maintenance
KIA	Killed in Action
KM	Kilometer
KTAS	Knots True Air Speed
LOC	Line of Communications

MACV	Military Assistance Command, Vietnam
MAF	Marine Amphibious Force
MOB	Main Operating Base
NE	Northeast
NM	Nautical Mile
NVA	North Vietnamese Army
OPlan	Operations Plan
PACAF	Pacific Air Forces
PACOM	Pacific Command
PCS	Permanent Change of Station
POL	Petroleum, Oil, Lubricants
QRF	Quick Reaction Force
RESCAP	Rescue Combat Air Patrol
RP	Route Package
RTAFB	Royal Thailand Air Force Base
SAC	Strategic Air Command
SACLO	Strategic Air Command Liaison Office
SAM	Surface-to-Air Missile
SEA	Southeast Asia
SEAITACS	Southeast Asia Integrated Tactical Air Control System
SIOP	Single Integrated Operations Plan
SOP	Special Operations Group
SW	Strategic Wing
TACC	Tactical Air Control Center
TACS	Tactical Air Control System
TDY	Temporary Duty
Tgt	Target
TOT	Time over Target
WESTPAC	Western Pacific