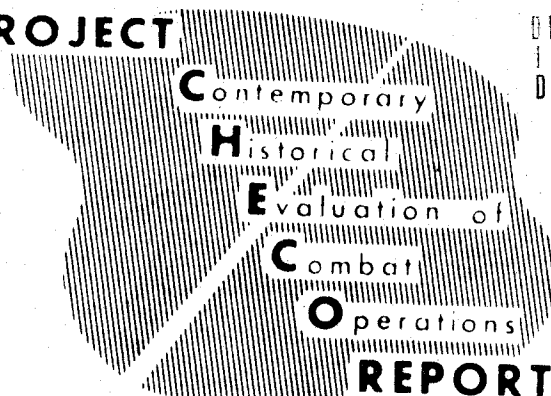


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STRIKE CONTROL
and
RECONNAISSANCE
(SCAR)
IN SEA

22 JANUARY 1969

APPROVED FOR
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HQ PACAF

Directorate, Tactical Evaluation
CHECO Division

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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 Evaluation of Combat Operations, was established to meet this Air Staff requirement. Managed by Hq PACAF, with elements at Hq 7AF and 7/13AF, Project CHECO provides a scholarly, "on-going" historical evaluation and documentation of USAF policies, concepts, and doctrine in Southeast Asia combat operations. This CHECO report is part of the overall documentation and evaluation 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 SEA.



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

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FOREWORD

"Strike Control and Reconnaissance" leads to the conclusion that the Air Force interdiction effort requires doctrinal formalization. The post-Vietnam future of the Forward Air Controller, especially in the interdiction role, must be decided, if the Air Force is to avoid having to relearn for the third time, the basic lessons of strike control that were lost after World War II and again after Korea.

The interdiction Forward Air Controller must be integrated with the force structure and made a part of a viable organization in peacetime. In this way, he will be able to operate and function in wartime. From lessons learned, the Air Force may be able to avoid an observation of Samuel Lyman Atwood Marshall, Military Critic and Historian, "The only thing we learn from history is we don't."

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CHAPTER I

INTRODUCTION

This report concentrates on activities of the USAF in the Strike Control and Reconnaissance (SCAR) function in Southeast Asia. The first task was to distill the doctrinal and operational essence of the strike control and aerial reconnaissance performed by an airborne element of the Tactical Air Control System. AFM 2-7, paragraph 3-9, was the present doctrinal basis for the SCAR function. It was listed under "Other Air Control Functions", which states that the airborne controller must be a fully qualified fighter pilot. Events have shown that this "luxury" has not been totally possible.^{1/}

The role for which the SCAR function was initially conceived, was strike control during the Korean conflict. The role was originally limited to the matching of high performance aircraft with fast moving targets. To this was soon added the responsibility for performing constant visual reconnaissance (VR) over the entire front line. Due to poor ground communications during Korea, the Forward Air Controller (FAC) was later given the additional responsibility of calling strike aircraft for immediate close support. With these three functions; Strike Control, VR, and strike aircraft procurement, the FAC became the focal point of the Tactical Air Control System (TACS).

Yet, during the entire conflict the airborne FAC was considered temporary. In fact, according to a Rand Study, the stature of the airborne FAC in Air Force Doctrine never changed from 1946 to 1966.^{2/} After Korea, the FAC organization quietly expired and once again the Air Force was without personnel, organization, or equipment.

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The comparison between Korea and SEA is close. Admittedly, there was no front line, but in SEA as in Korea, total air superiority, the vital precondition for the use of the slow moving airborne FAC, was easily maintained. Even given this passive air environment in SEA and the FAC ability to find targets, communicate with the TACS and aircraft, plus increase the accuracy of close support, a significant FAC operation did not immediately come into existence. Therefore, it did not play an important role in the counterinsurgency stage.^{3/}

In mid-1962, the Tactical Air Command conducted an analysis of the Army-operated Tactical Air Support System which revealed some major weaknesses:^{4/}

- Inadequate response of the system to the immediate close air support and tactical air reconnaissance needs of front line Army commanders.
- Lack of mobility of AF facilities placed in the field to coordinate and commit air support to the Army.
- Lack of reliable communications to coordinate air support requirements with ground and air echelons.
- Lack of trained personnel, continuously available, who are intimately familiar with the coordination and planning techniques for providing air support.

To correct these deficiencies, the USAF in conjunction with the U.S. Army, developed a concept for improved joint air-ground coordination which was jointly approved in April 1965. This new agreement established an organization and outlined the responsibilities of each service. The classic TACS, which resulted from the improved joint agreement, was first employed in combat by Tactical Air Control Party (TACP) elements assigned to the 1st Cavalry Division (Air Mobile). TACPs were positioned with each maneuver battalion

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and cavalry squadron, as well as with each brigade and at division headquarters. The assigned FAC moved with his battalion on the ground and performed, mainly, the air liaison function to the battalion commander. Since earlier experience in Vietnam indicated that the airstrike control function could not be performed from ground positions, airstrikes controlled by the FAC established a requirement for an airborne control vehicle, but did not negate the requirement for an Air Liaison Officer (ALO) to be positioned with the battalion command element. As a result, 0-1 aircraft and, as necessary, Army helicopters were employed by assigned FACs to control airstrikes and coordinate target acquisition requirements with the ALO and the command element of the ground unit being supported. ^{5/}

Prior to the arrival of division-size Army units in 1965, components of the TACS were positioned in Vietnam, and tailored to accommodate the unique air support requirements of counterinsurgency operations. Direct Air Support Centers were established in the Army of the Republic of Vietnam (ARVN) Corps areas. USAF FACs and ALOs were stationed in support of ARVN Corps, Division, and Regimental size units. The Vietnamese Air Force (VNAF), during this period, possessed limited capability to provide tactical air support to ARVN forces. USAF Special Warfare Forces also had a limited capability, which soon became overtaxed as the conflict escalated. By default, on many occasions, FACs and ALOs assigned to ARVN ground units performed the tactical air support functions of battlefield reconnaissance and area surveillance in the 0-1 aircraft, in addition to the airstrike control functions normally associated with the TACS concept. ^{6/}

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As a result of this situation, a VR program was established which provided for detailed aerial surveillance and intelligence collection of enemy activity in the ARVN Corps areas. FACs performed the vital function of seeking out hostile overt and covert activities in their VR area of responsibility. When activities discovered appeared to be hostile (the definition for hostile activity was generally left to the individual) the FAC would request air support and upon arrival of either VNAF or USAF fighter aircraft, control the airstrike against the hostile force. The program was successful, but led to the formulation of concepts and defined requirements, which may not have been in concert with the 1965 joint USA/USAF agreement.^{7/}

The SCAR concept developed against this backdrop. Expansion of the FAC role in support of the U.S. Army and Free World Forces in Vietnam is presented in the CHECO report, "Forward Air Control Operations in Close Air Support Role in South Vietnam."

The problem of air interdiction was not significant in the early phase of United States assistance in Vietnam. The massive inputs of men and material through Laos and the Demilitarized Zone (DMZ) by the North Vietnamese had not reached significant proportions, and self-imposed U.S. restraint precluded air attacks against North Vietnam. It soon became obvious, however, that the ever increasing flow of supplies to the insurgents must be located and destroyed. Consequently, planning was initiated for an American air interdiction role, and on 14 December 1964, the first armed reconnaissance flew in Laos, which announced the birth of BARREL ROLL. Initially, limitations were imposed and only targets which were clearly military could be

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struck, but through 1965, restrictions were gradually lifted.^{8/}

The ever-expanding FAC role in SEA, which soon evolved into a gradually increasing interdiction function, will be developed in the following chapters. Aerospace Doctrine identifies interdiction of external support in counter-insurgency in the following manner:^{9/}

"Often the lines of communications for insurgents extend into neighboring countries, compounding the problem of intelligence and interdiction. Because insurgents generally suffer from a serious shortage of weapons, ammunition and food and other supplies, interdiction can strike a critical blow if supply routes can be located and successfully sealed off.

"Night and marginal weather capabilities, as well as weapons having delayed effects are essential. However, effective interdiction may require direct or covert action against insurgent bases within the neighboring state or states."

AFM 2-1 defined interdiction:

"...to prevent the enemy from supplying himself with resources at the time and location required to conduct effective, sustained military operations... Tactical Air Force interdiction operations are designed to disrupt this flow through destruction, delay or harassment to neutralize the effectiveness of enemy reserves and compromise the position of enemy forces engaged directly in combat."

The problem of finding worthwhile targets in the interdiction effort soon became evident. This fact, coupled with the strict Rules of Engagement, required precise area reconnaissance and control of airstrikes, which could only be provided by an airborne FAC--thus the inception of SCAR.

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CHAPTER II

SEMANTICS

Confusion arose from inconsistencies in distinguishing the FAC role from the visual reconnaissance and strike control role associated with interdiction. Misuse of the term "FAC" resulted in coining such terms as NIFAC, AFAC, VR/FAC, unarmed and armed FAC, and other terms and expressions. As a result of this, certain tactical air operations were misunderstood not only within the Air Force, but within other services, the Department of Defense, Congress, and industry. As such, the FAC concept needed some clarification. In March 1967, the Commander, TAC, stated: ^{11/}

"Accordingly, all personnel of Tactical Air Command will use the term FAC only as it applies to Air Force personnel assigned to ground forces as a planner, advisor and controller of close air support operations."

The Chief of Staff, USAF, agreed with the TAC Commander about retaining the classical concept of a FAC and said that such related, but separate functions as reconnaissance and strike control of interdiction operations must be defined separately and distinctly as elements of the TACS, which can be used independently of U.S. land forces. He stated: ^{2/}

"In my view, the definitions and descriptions to be applied to these functions are extremely important. Events have shown the necessity for continuous reconnaissance of enemy infested areas, the control of air interdiction strikes conducted against targets acquired therefrom, escort of airborne and surface convoys, and related combat tasks. Up to now, control functions have been conducted utilizing FAC techniques and equipment. How they will be conducted in the future must be

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determined and implemented as air doctrine."

To present a clear distinction of these separate functions, the TAC Commander offered the acronym COBRA for Controller, Battlefield Reconnaissance and Attack, to designate the pilot who conducted VR, performed a forward control function, and engaged in airstrike operations. He also noted that the COBRA function did not appear to fit into the TACS, but seemed more suited to the Light Armed Reconnaissance Aircraft (LARA) concept and consequently should be identified as an element of the Special Air Warfare Force.^{3/}

In view of the efforts to arrive at a jointly agreed set of definitions and descriptions for the various systems and concepts in use, the USAF Chief of Staff requested that TAC conduct an analysis of the current and future requirements of the Tactical Air Support Subsystem. In this analysis, all elements included in the Tactical Air Support Subsystem were to be examined. The analysis was completed and briefed to the Air Staff. Those functions previously defined as COBRA were listed under SCAR.^{4/}

Tactical Air Support Subsystem Analysis

The Secretary of the Air Force noted the effectiveness of the TACS in SEA, and was concerned that the resources and experience would disappear as happened in Korea, unless steps were taken to provide a viable concept and force structure rationale to preserve the capability. Of particular interest was clarification of roles.^{5/} The subsequent TAC-sponsored study included members of USAF and PACAF and identified two distinct airstrike control functions; one that was performed in direct support of ground maneuver elements, and one that did not directly support ground maneuvering units.

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Close air support of maneuver forces in conventional warfare imposed certain restrictions on USAF air-to-ground operations. The establishment of a Fire Support Coordination Line (FSCL) and a Forward Edge of the Battle Area (FEBA) by the maneuver force represented the tactical jurisdiction of that maneuver force. Within these defined areas, USAF tactical air support resources were normally committed at the request of the maneuver force, as this was the defined area of operation of the FAC and ALO. Thus, lucrative, mobile, relatively fixed, or fixed targets within this defined area, through a lack of VR, became a threat to the friendly force and resulted in a preponderance of immediate requests for airstrikes.^{6/}

To alleviate this threat it was incumbent on the USAF to perform unilateral reconnaissance and surveillance in front of the established FSCL. In this area, low performance aircraft were employed to repeatedly survey, acquire targets, and request and control airstrikes, all beyond the maneuver of friendly forces. This activity combined the function of airstrike control and target acquisition.^{7/}

In Vietnam, where battle lines could not be established, the FSCL was characterized by a zone termed Tactical Area of Responsibility (TAOR) for each maneuver force. Airstrike control within the TAOR was performed by the USAF FAC attached to the maneuver force. The areas between these TAORs were characterized by a permissive air environment, the absence of a maneuver force, a mixture of friendly and hostile inhabitants, and a target system which posed an immediate threat to friendly indigenous populations or adjacent friendly forces.^{17/}

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To accomplish the acquisition and subsequent destruction in areas outside the FSCL or TAOR, and in unilateral operations, SCAR units were proposed under the control of the Air Force Component Commander. ^{18/} The functions were:

- Perform liaison with non-military, paramilitary and other indigenous elements.
- Provide target intelligence on the movement and disposition of hostile elements.
- Become familiar with tactical areas beyond the scheme of maneuver of any committed force.
- Provide near real time acquisition of hostile targets.
- Request airstrikes unilaterally on acquired targets.
- Provide airstrike control to tactical aircraft committed against acquired targets.

These functions were separate and independent from those performed by the FAC attached to the Army. Where the Army attached FAC operated within the TAOR and was responsive to the Army, the SCAR concept would be performed outside the TAOR and would be responsive to the Air Force commander and would provide unilateral Air Force interdiction missions.

The mission of the SCAR unit was to conduct visual surveillance, reconnaissance, and airstrike control in support of interdiction or quasi-interdiction operations. The specific tasks of a SCAR unit were to: (1) conduct reconnaissance in an assigned area to acquire targets which posed a threat to friendly forces; (2) conduct air surveillance in an assigned area to report, restrict, and complicate hostile movement and activity; (3) control or direct air attacks against targets acquired in tactical areas beyond and independent

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of fire and maneuver of friendly forces; (4) provide surveillance escort of logistics convoys and other lines of communication elements; and (5) act as an airborne communications relay to augment air/ground communications. ^{10/}

In the fall of 1967, the Commander, 7AF, requested his staff to further explain the acronym SCAR. It, and the acronyms preceding it, had no official sanction. After receiving a Staff Summary Sheet, the Commander, 7AF, expressed his views on the concept: ^{11/}

"I don't agree with SCAR. When the war is over, we will be lucky to have enough authorization to maintain required FACs for minimum Army support."

U.S. Army Viewpoint

In May 1968, the U.S. Army Staff was briefed on the SCAR concept by members of the Air Staff. At that time, the Army was concerned over the apparent duplication of VR in those areas where Army observation aircraft performed reconnaissance and surveillance missions for the land force commander. In general, the Army VR program was designed for employment within the division areas of influence and Air Force support within the boundaries of these areas was provided in response to Army requests through the Joint Air-Ground Operations System (JAGOS). The Army understood that SCAR assets would not be employed within division areas of influence, unless they were requested and controlled through JAGOS procedures. These requests for SCAR support were expected to be infrequent, since the Army provided organic air vehicles for habitual Army requirements. ^{12/}

The Army was also concerned with the methodology of quantifying SCAR

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aircraft requirements. The system of basing requirements on numbers of Army divisions did not appear valid with the principal function of SCAR. The Air Force stated that the method of quantifying SCAR requirements in terms of Army divisions was done for simplicity and clarity, but the size of the area to be covered by systematic surveillance was the qualifying factor. Furthermore, the forward interdiction area was sensitive to the degree of deployed ground forces.^{13/}

It appeared that the Army view would restrain the Air Force from applying its forces against the enemy, because of a unilaterally declared primacy of interest of ground commanders in a reserved, but uncertainly defined "area of influence". Also, the possession by the Army of certain aerial capabilities relegated the Air Force to an auxiliary role, which was contrary to statute and directive. The Air Force clearly understood that airstrikes within the bomb line must be closely coordinated with ground commanders. Beyond that line, artificially imposed restrictions in the application of airpower would result in lost opportunities, which would eventually have an adverse impact on friendly forces. The SCAR concept envisioned operations beyond the bomb line to locate the enemy and direct airstrikes against him. The total product of the systematic SCAR process would be available to the joint combat team with resultant savings in funds and resources.^{14/}

In September 1968, the Army Chief of Staff stated that the Army supported the SCAR concept, but was still concerned regarding the impact on Army interests in the combat zone. Accordingly, he regarded the introduction of the SCAR concept as a matter which should be coordinated with the Army. He saw no

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service role issue, provided the concept was in support of the Air Force interdiction mission which was the Army's understanding of the purpose of SCAR. The Army Chief of Staff further stated: ^{15/}

"It should be clear from our experience in Southeast Asia that the land force commander will be interested in all Air Force reconnaissance, surveillance, and strike missions over most, if not all, of the combat zone. Within the land force commander's area of influence coordination is necessary to ensure unity of effort. In the area occupied by land forces and extending out to the FSCL, or in the limits of an area of operations, the land force commander will exercise overall control of operations. This basic concept of areas, as you are aware, is dynamic, particularly so in view of our airmobile and air cavalry operations, long range reconnaissance patrols, and agent and friendly guerrilla operations. Areas for these operations change from day to day. Thus, there is a stringent requirement for coordination of all activities within or contiguous to these areas. Certainly, in a sophisticated combat environment there will be a requirement to coordinate thoroughly the interface of SCAR with Army combat activities."

Finally, the Army considered it unrealistic to support a large SCAR force when it felt that Army divisions were not in fact fully supported. This last point was undoubtedly based on an early 1968 report to COMUSMACV on the ALO/FAC requirements. The report revealed serious shortages when compared to the needs of current and future operational tasks. At that time, 116 more ALO/FAC personnel were required, as well as 119 additional FAC aircraft. A realistic appraisal of USAF aircraft inputs minus attrition showed that 7AF would still be short 55 FACs by December 1968. ^{16/}

The USAF Chief of Staff agreed in October 1968 that service roles and missions should not become an issue, since SCAR was intended primarily for

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support of the Air Force interdiction mission. He further stated: ^{17/}

"As you know, the Air Force has been a strong proponent of coordination and mutual support among the military Services, both in the development of concepts and capabilities of mutual interest and in their application in an area of operations under the overall control of a joint force commander. I assure you that SCAR is no exception."

He went on to point out that SCAR was not a new concept, but more of a formalization of a concept that was used for many years. For example, SCAR-type missions were used in World War II, particularly in Italy (with an aircraft called Horsefly, an L-5 which was hardly different performance-wise from the O-1), and were eventually employed again in Korea as part of the T-6 Mosquito mission. In both cases, the program lapsed at the end of hostilities. The capability in expertise and manpower had to be resurrected or created as another need became apparent. ^{18/}

In other words, the "wheel" was continually reinvented. Undoubtedly, the need would arise in the future, and formalizing the SCAR concept was intended to preserve the function as a continuing requirement against which a force in being would be available at the outset of conflict. ^{19/}

Common Definitions

The problem of ALO/FAC semantics within the Air Force has undoubtedly caused confusion in identifying roles and missions. The noun "FAC" has been variously used to describe a function, a mission, a person, and even equipment. The SCAR function has been used to define the same terms.

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Undoubtedly, the multi-headed articulation has worked to the detriment of all concerned and resulted in various strata of command "talking a different language." For example, in Vietnam, the Chief of Air Operations, ^{20/} 504th Tactical Air Support Group stated:

"We in-theatre, for our own convenience, began to break down the two general classifications of FACs used, by using the term FAC and SCAR for our own purposes. These are the people who at one time were called Category A and Category C FACs (more semantics). It was the same relationship. First, let's define what the term FAC is, for our use in SEA. The classic definitions in the manuals define certain things, but in SEA we take that to mean anybody who has been through a tac fighter RTU-instant fighter pilot program--including the current F-86 H and AT-37 course which has been developed for that purpose. Secondly, we have requirements in the ARVN system which is the other major breakdown of ours, plus the third country people, and finally what we generally refer to as out-country missions...they do not require the tac qualified fighter pilot. These people, for our own convenience in talking about them, we call them SCARS...So far as practice is concerned, every individual in the TACS system, operating in the field, is known as a FAC and his mission is understood as being a FAC mission. Their full mission (SCAR) is the exact same mission as the one performed for US forces, not one bit of difference except those people who work outside the limits of SVN in an interdiction role and do visual reconnaissance toward the end of developing interdiction targets."

In an ALO/FAC/SCAR study prepared by 7AF in February 1968, definitions of the FAC/SCAR role were presented. Further, the study noted that the practice

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of tailoring FAC qualifications strictly to an area of operations or to a different class of ground forces in SEA to accommodate CONUS resources or training limitations restricted flexibility of FAC employment. For example, manning the 23d Tactical Air Support Squadron at Nakhon Phanom, Thailand, with SCAR pilots restricted their potential employment in-country, where they could have been controlling unplanned immediate airstrikes in support of U.S. Army ground forces in contact. The FAC/SCAR definitions were: ^{21/}

FAC: A FAC controls airstrikes in close support of ground troops, performs artillery and naval gunfire adjustments, provides convoy and ship escort, and conducts visual reconnaissance. He is a current or previously qualified pilot of tactical fighter aircraft with additional training in air-ground operations, the tactical air control system, close air support, and weapons effects. His training prepares him to perform the Air Liaison Officer function with U.S. Army ground forces, and to advise/educate ground forces on air-ground weapons capabilities versus targets; strike aircraft capabilities with various weapons; and related tactical air capabilities and employment in local environments.

SCAR: A SCAR pilot must be able to demonstrate a capability in weapons delivery events; visual reconnaissance and surveillance techniques; target acquisition and marking; strike control; and command and control procedures. A tactical fighter pilot background is desirable but not mandatory. The SCAR pilot does not perform the ALO function with ground forces nor does he operate in the more critical environment within the fire and maneuver area of friendly forces. (NOTE: SCAR pilots without a tactical fighter pilot background were serving with and assigned to ARVN forces, 5th Special Forces, and to MACSOG operations where they did provide an ALO function and controlled airstrikes within the fire and maneuver of "friendly forces.")

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Although the wording of the above definitions varied, the salient difference was the fighter/non-fighter background. By making this distinction, severe pinches in assigning pilots frequently occurred. Since 1 March 1968, the 504th TASG noticed a trend which indicated the resources of FAC qualified pilots were being depleted to the point where a major realignment was necessary. From 1 March until the middle of May the 504th received approximately 80 ALO/FAC/SCAR pilots with only 15 fighter qualified FACs included in the total. Consequently, the US/Free World Forces became critically short of qualified people. Complicating the problem was the fact that the 504th had no way of forecasting gains into the system because they did not actually know, earlier than his arrival at the PACAF Jungle Survival School, who was arriving and what the man's qualifications were. ^{22/}

One solution to the problem was to transfer available fighter pilots assigned to SEA units. This action would require in-theatre indoctrination which was accomplished by all new FAC personnel. The second solution was to delete the requirement for a fighter pilot background. Experience had shown that tactical fighter experience assisted the FAC pilots for only the first month or so, if at all. The other pilots assigned the SCAR role with the ARVN system, or out-country, were as satisfactory in the performance of their jobs as pilots with tactical fighter experience. Therefore, the 504th TASG suggested that non-fighter qualified pilots be considered fully FAC qualified after three months duty in the field. ^{23/}

To alleviate the manpower strain, 7AF authorized the 504th to assign experienced SCAR pilots as FACs as a temporary expediency, until fighter

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qualified FACs were again available in adequate numbers. In no case would a non-fighter qualified ALO be assigned as an ALO in US/Free World Forces. ^{24/}

The observation of the 504th concerning the relative FACING abilities of fighter qualified pilots versus non-fighter qualified pilots warranted further exploration. The following quote was derived from interviews and End of Tour Reports of both fighter and non-fighter background FAC pilots: ^{25/}

"After working at my job about two months, and continuing throughout my tour, I became convinced that it was a waste of time and money sending me through the F-100 school at Luke AFB. My orders were changed to an ALO assignment two weeks after arrival at Luke. I feel the planners probably knew this would happen before my arrival. What I learned there certainly didn't warrant four months' training and all the expense involved. I feel I could have been just as effective as a FAC if I had not attended. All the useful information could have been obtained from a book or briefing."

In commenting on the above FAC's report, the ALO II Field Force, Vietnam noted that the Army/Air Force inter-service agreement required a qualified fighter pilot as a FAC in support of U.S. ground units. AFR 50-23 unilaterally required fighter qualification. (The Chief of Staff, USAF, resisted all attempts to degrade the requirement.) The ALO further observed that while fighter pilots usually developed into outstanding FACs, many individuals who had no previous fighter experience became equally as well qualified. Regarding the fighter school, he thought it unnecessary from a training standpoint, particularly for anyone who had previous fighter experience. The Deputy Director of III DASC ^{26/} concurred with both viewpoints.

"The F-100 Combat Crew Training Course is a waste of manpower for FAC preparation. The O-1 Combat Crew Training Course at Hurlburt is redundant to the 504th TIS (the in-country training program) and should be eliminated. These two courses require six months

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for completion and offer very little toward the end result... I feel the categorization of FAC's into A, B, and C should be eliminated since it serves no useful purpose."

The Deputy Director, DASC ALPHA rebutted the ALO's report, as he believed it essential that an ALO/FAC possess a current fighter background. Not to have this fighter experience was to attempt to inform the ground commander of fighter tactics without experience and would therefore result in loss of stature. He also stated that the U.S. Army was desirous of taking an increased role in tactical air support, and if it was determined that a fighter background was not mandatory, the USAF position for tactical air control would be substantially weakened. Consequently, he urged that the fighter training remain as a requirement for ALO/FAC training in support of the U.S. Army. ^{27/}

A FAC assigned to the 1st Brigade, 1st U.S. Infantry Division stated: ^{28/}

"I am still bitter toward the Air Force personnel system for my reassignment from F-100s to O-1s. I am one of the many who volunteered for F-100s in SEA when the Air Force asked for volunteers. I feel it was unjust for the Air Force to reassign class after class of F-100 volunteers at Luke for the crash ALO/FAC program. In addition, to add injury to insult, as a future FAC in the F-100 program, I received the entire tactical fighter qualification course, which prolonged my pre-SEA training unnecessarily."

The Chief of Air Operations, 504th TASG, at the end of his tour as a FAC and Staff Officer commented: ^{29/}

"The RTU was of assistance, but so far as my mission as a FAC was concerned, I would say initially it gave me a greater insight into the weapons effect and perhaps techniques of controlling, but I did say only initially. It's been my experience in SEA that it is the person's individual qualifications as an officer which determines his eventual qualification as a FAC, rather than any specific background. My estimate would be that within three months in the field

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as a FAC would qualify any individual to the extent of his capability regardless of his background. Occasional arguments come up on the subject, but they are from expectable sources. People who have spent all their lives in Tac fighters, suggest that only a Tac fighter pilot can do a good job as a FAC. People who have come from other backgrounds, and have been through fighter RTU's, suggest that their training was interesting and beneficial but not mandatory. People who haven't either of those backgrounds still have become highly qualified and respected FACs. Their feeling of course is that none of the above backgrounds are required."

The skills referred to were related to control of the strike aircraft. That skill must be learned regardless of the background. A controller who has spent a thousand hours or more in an F-100 or F-4 had no greater skill in controlling aircraft the first time out than an individual who had spent his career flying C-141s. Another skill, and perhaps the one most difficult to learn, was picking out very detailed and small targets on the ground using large scale maps. Interestingly enough, the last skill mentioned is practiced daily by tactical reconnaissance pilots, yet they are not considered fighter^{30/}qualified.

The following observations were made by FACs and Staff Officers scattered throughout SEA:^{31/}

"I don't really think it is a valid requirement (RTU.) My opinion is that I could have come directly to SEA and accomplished my job. Maybe not quite as satisfactorily the first month, but I do believe that by going through the Air to Ground Operations School, and maybe an extra few weeks of flying in the O-1 or O-2, the individual airplane I would be flying, I would have become much more familiar with FAC tactics and would have been of great value on initial arrival here. If the RTU program must continue, possibly an orientation program would suffice in nature, just to become familiar

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with the fighter operation. In my observation of Sector FACs (ARVN FACs) putting in strikes, I would watch them, listen to their radio procedures and their techniques in controlling the strikes. They would use exactly the procedures we were using. You can only tell the difference between somebody who has been out in the field for six or eight months, but not very much as to whether he is a Sector, ARVN or US/Free World FAC."

* * * * *

"I recommend that we stop categorizing FACs. I don't feel there is any difference in the A, B, or C FAC. I am a class C FAC. I was assigned to the 1st Brigade, U.S. 25th Infantry Division. I do not see any difference in the work of the A or C FAC. We are now sending many pilots to F-100 school to make them instant Class A FACs."

* * * * *

"A second frustrating situation is the FAC classification, i.e., Class A, B, C. I will agree that initially a FAC with fighter experience had a definite advantage over me with no experience at all. However, after a couple months of flying I don't believe a significant difference exists between the two types of pilots...Recommend that at a set period of time and experience level, each FAC be given a chance for upgrading commensurate with his ability."

* * * * *

"Following a seven month tour in an F-100 squadron, this additional experience as a FAC gave me many varied insights into the aspects of tactical close air support. Previous experience as a fighter pilot proved an asset in these later positions, but was not so apparent as to be a mandatory requirement."

* * * * *

"The differentiation of forward air controllers, on basis of their experience, into different categories is ridiculous and unnecessary. If there is any lack of proficiency or knowledge by a non-fighter experienced FAC, it is quickly eliminated by experience in the field. This makes all FACs equal except for their individual personal abilities and eliminates any need for differentiation of forward air controllers...The fighter experience doesn't materially affect his performance as a FAC."

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* * * * *

"Requiring FACs for the U.S. forces to be fighter pilots is a luxury we cannot afford. A background in fighter aircraft should not be a necessary prerequisite for a class A FAC. The F-100/FAC exchange program is a gross waste of manpower. As an F-100 pilot, I was just becoming fully qualified and proficient in fighter operations in SEA when I was given a FAC assignment. Now, after six months as a FAC, I am just learning enough about FACing and VR operations to be effective. I estimate eight months of my tour in Vietnam have been spent in training. This example is true of most people who have been involved in the F-100/FAC swap."

* * * * *

"An irrelevant mystique has been built up concerning the prior experience a FAC needs to be effective. I think it has generally been proven in the field that a FAC's performance depends only initially on his rated history. With a little training and experience most differences vanish."

* * * * *

"Knowing this opinion is at variance with current policy, I suggest that the differentiation between the new FAC who has had fighter experience and one who has not should be discontinued. Any pilot, after finishing Hurlburt and Theatre Indoctrination, can properly be assigned to either the FFV (U.S. Army) or ARVN system. In three weeks, you couldn't tell them apart."

* * * * *

"I still do not feel that the FACs in support of the U.S. Army should have to be fighter qualified. This requirement was made to pacify the Army when the Air Force was afraid it would lose the close air support role. Any fighter pilot will tell you that he has received just as competent controlling from Sector FACs and Marine FACs as from class A FACs, and the Marines who control are often not even rated pilots, let alone fighter pilots. So let's stop babying the Army, quietly admit we made a mistake and eliminate this grossly expensive, needless experiment."

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Another postulate for greater flexibility of the airborne controller was a 7AF report which traced the need for cyclically shifting the bulk of airpower from close support to interdiction. The requirements for in-country close support sorties and out-country interdiction sorties varied greatly with time. They usually varied out of phase--when the force requirements in-country were up, out-country interdiction requirements were down and vice versa. The cyclic pre-stockage-offensive-pre-stockage-offensive sequence of enemy operations offered opportunities for major increases in force effectiveness by changing the in-country/out-country sortie allocations so as to have the greatest impact on the enemy.^{32/}

During periods of enemy pre-stockage and resupply, a major shift of strike and FAC resources to the interdiction mission would appear logical. Conversely, during periods of enemy in-country offensives, a shift to close support would be required.^{33/}

Moreover, there were major variations in the enemy's resupply and pre-offensive logistical efforts that imposed major variations in force requirements for the out-country interdiction program. As the pre-offensive stockage must precede major offensive action in-country, the major fluctuations in strike force requirements in-country and out-country were out of phase in a vital way. However, even though close air support requirements should fluctuate with enemy offensive campaigns and interdiction should fluctuate with enemy logistical efforts, there was considerable stability in the allocation of strike resources. For example, during the first eight months of 1968, which included the TET and May Offensives, the allocation of forces was

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61 percent in-country and 39 percent out-country with a weekly standard deviation of only 5.3 percent. It would be difficult, if not impossible, to find a measure on which to base force requirements with such stability in a dynamic military situation.^{34/} *

Summary

Qualifications for SCAR personnel evolved as a result of a multitude of messages, letters, studies, and meetings. As a result, different sources used slightly different wording to define SCAR qualifications. Consequently, in September 1967, PACAF, in an attempt to standardize the terminology, summarized and redefined: "Personnel performing the SCAR function should demonstrate a capability in VR and surveillance techniques; have knowledge of the characteristics and capabilities of high performance fighter aircraft; demonstrate a capability in weapon delivery events; and have a detailed knowledge of the command and control system. The point was made that the SCAR pilot would not be required to perform the liaison function, nor to act as an advisor in weapons selection or employment."^{35/}

Additionally, precise airstrike control and discriminating target acquisition, while desirable, would not be as critical in the environment in which the SCAR pilot would be employed. Accordingly, the basic background qualifications for a SCAR pilot did not require a fighter background. PACAF further stated: "The term tactically qualified pilot would not be used in describing FAC or SCAR personnel, except to identify the function as being performed in a tactical organization."^{36/}

Action by Hq USAF resulted in a shredout of the FAC AFSC. A 1444A

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indicated a fighter background, while 1444B indicated a non-fighter background. This was accomplished primarily in an attempt to clarify for USAF Manpower, the different requirements for FAC qualifications for duty with U.S. as opposed to ARVN forces. The policy in SEA and TAC stipulated that those with the "A" suffix would be called FACs and those with the "B" suffix would be called SCARs. Seventh Air Force believed this class distinction resulted in misunderstanding among the individuals and their supported ground force units.^{37/}

Rather than having a new title for the FACs, based on their service background, 7AF suggested that the shredout presented an opportunity to return to the overall title of FAC, which was universally understood. The "A" and "B" suffixes identified individual backgrounds to those whom such identification was pertinent, specifically Manpower and Personnel.^{38/}

The evidence clearly indicated that the experienced SCAR pilot would have no trouble performing the FAC mission since they already were controlling airstrikes and, through experience, achieved a working knowledge of TAC fighter operations. To utilize them as FACs in support of the U.S. Army, however, had some far reaching implications. Some of these were:^{39/}

- TAC was losing the majority of FACs trained in SEA. They were returning to their former commands with relatively few returning to TAC where it would be advantageous to build this reservoir of experience and maintain FAC, or closely related TAC skills. Eliminating the requirement for fighter qualification would further reduce the number of FACs returning to TAC as fewer officers with tactical background would be available for end of tour assignments.

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- The tactical fighter career officers should have first hand knowledge of the U.S. Army. Serving with the Army as an ALO/FAC was an excellent opportunity to gain this understanding.
- Reducing the qualifications for ALOs/FACs could be interpreted by the Army as a reduction in the significance of the task. It was possible that the Army would endeavor to control their own air.

It has been established that the FAC in support of ARVN forces performed identical tasks as the FACs who supported the US/Free World Forces. The role of those FACs, who operated outside of the maneuver and fire of friendly forces, was to conduct VR and airstrike control in support of interdiction or quasi-interdiction missions. There appeared to be some question as to the validity of requiring fighter qualified pilots in support of the U.S. Army, particularly by the use of the "instant fighter pilot" RTUs. Conversely, there appeared to be little doubt as to whether the ALOs assigned to the U.S. Army required an extensive fighter background. The constant, daily missionary work required to achieve and perpetuate an understanding of the use of air-power and to thoroughly indoctrinate future Army leaders in the employment of air demanded liaison officers with comprehensive tactical backgrounds.

As happened in many instances, in the final analysis common usage dictated acceptance. As described earlier, the term FAC was applied throughout the entire spectrum of airborne controllers in SEA, regardless of whom they supported or the type of vehicle they flew, including F-100Fs and F-4s. The shredout of the FAC AFSC identified the experience of the controller for manpower requirements and personnel assignments, therefore the term FAC will be used in this report to identify a person, as it was used in SEA, and SCAR will

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be used to identify a function. Further, the FAC mission in support of the ARVN will not be addressed as his role was similar to that of the FAC supporting the U.S. Army.

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CHAPTER III
OUT-COUNTRY OPERATIONS

Out-country operations prior to 1965 consisted primarily of reconnaissance missions in Laos and Electronic Intelligence (ELINT) escort missions in the Gulf of Tonkin. These operations were straightforward and subject to tight control which allowed for little operational flexibility. The range of operations was soon expanded to include armed day and night road reconnaissance in Laos, airstrikes in support of Laotian ground forces, and coordinated strikes of sizable forces against major fixed installations in North Vietnam.^{1/}

Laos

The Laotian interdiction program, which began in December 1964, was named BARREL ROLL and encompassed the northern part of Laos above the panhandle. Under this program, USAF and Royal Laotian (RLAF) aircraft ranged the highways striking targets on the Ho Chi Minh Trail. The new interdiction program was basically a combination of daylight armed reconnaissance, night route reconnaissance, YANKEE TEAM flights (aerial photography), and Royal Laotian Air Force (RLAF) T-28 operations, which provided a balanced day and night interdiction effort dedicated to exerting constant pressure on the enemy logistic network.

A follow-on interdiction program known as STEEL TIGER, located in the panhandle of Laos, began on 3 April 1965, and basically followed the pattern of BARREL ROLL. BARREL ROLL/STEEL TIGER operations were accomplished through coordinated employment of a C-47 airborne command and control center, A-1E

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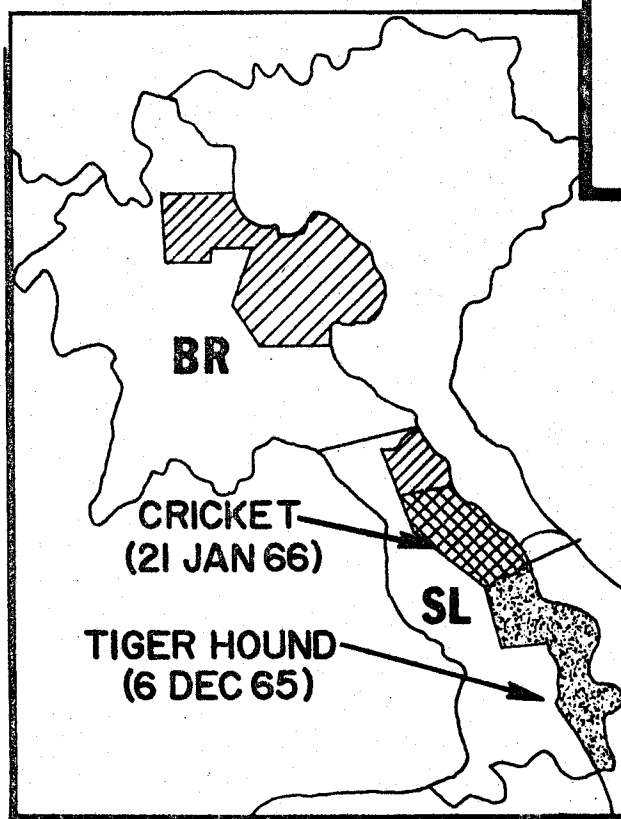
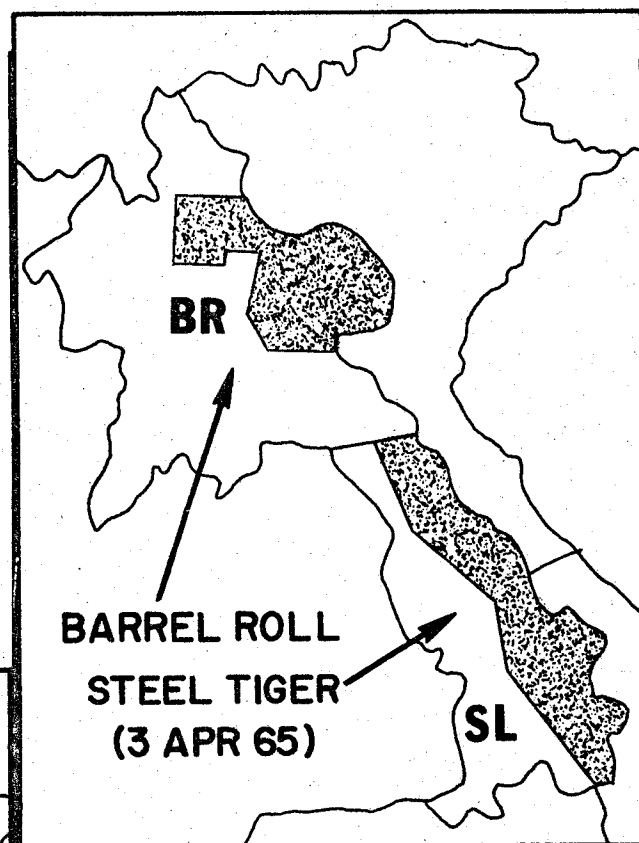
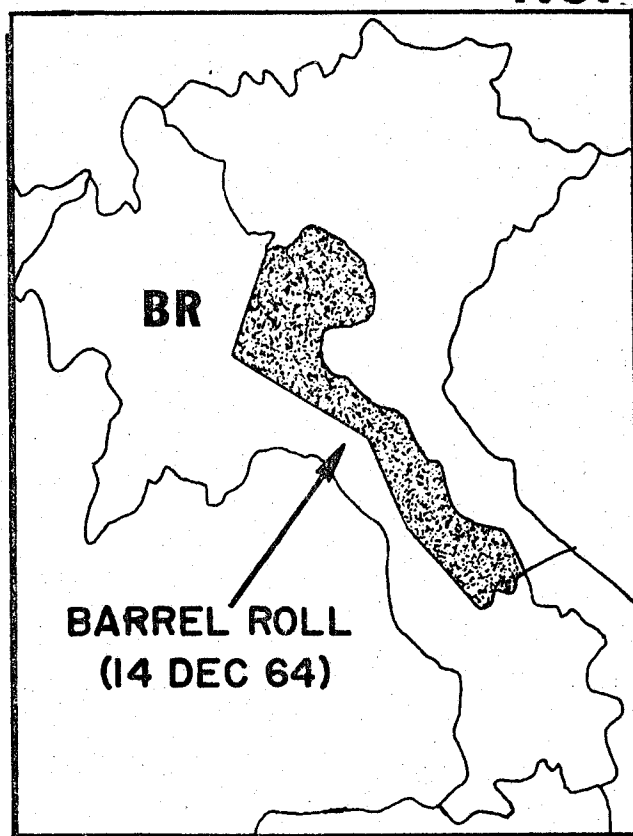
FACs, and F-105/F-4C strike aircraft. A flurry of enemy activity in the southern panhandle in late 1965 resulted in 1,657 USAF and Navy sorties being flown in that area between 12 November and 9 December 1965. This increased emphasis on the panhandle resulted in the creation of TIGER HOUND, encompassing an area within the southern STEEL TIGER operating zone and included parts of Saravane and Attapeu provinces.^{3/} (Fig. 1.)

A joint organization was established under the 2d Air Division which was dedicated to directing operations in the Laotian area. USAF and USN aircraft flying combat strikes in the TIGER HOUND area were guided to assigned targets by an airborne command and control system and USAF FACs. Laos observers were assigned to FAC aircraft to reduce the time required to obtain target approval. Under the code name CRICKET, operations were begun utilizing FACs stationed in Thailand to coordinate strikes against authorized targets, which were discovered through intelligence obtained from Road Watch Teams.^{4/} (Fig. 1.)

Controlling airstrikes in Laos carried tremendous responsibility. For instance, napalm could not be expended in Laos, unless authorized by the U.S. Embassy in Vientiane. Night attacks on fixed targets were not authorized. Bombing, including radar bombing through an overcast, was prohibited except as specifically approved by the U.S. Embassy, Vientiane. Flights under FAC control would not expend ordnance if the target were in doubt, if instructions were in question, or if the flight leader decided against it for any other reason. Camp fires and civilian habitations could not be struck.^{5/}

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EVOLUTION
of
BARREL ROLL
STEEL TIGER
TIGER HOUND
CRICKET
1964-1966

FIGURE 1

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There were several sources for providing FACs for controlled strike missions in Laos. Ground FACs were associated with the Forces Army Royale (FAR) elements, and Laos based airborne FACs operated under the aegis of the RLAF. Regarding the ground based FAC, a ground based FAC/liaison team, call sign ELEPHANT, was operational with a friendly force located astride Route 9 in Laos. This team, with English speaking personnel, had ground-to-air/ground-to-ground communication capability. Primary contact by the ELEPHANT team with airborne aircraft was with HILLSBORO (airborne command and control center), and FAC 0-1s on FM, as they did not have UHF capability. The purpose of this team was to aid in identification of friendly positions, prevent accidental bombing, and coordinate airstrikes in the vicinity of their position. During daylight hours, strikes could be conducted by direction of HILLSBORO and under the control of FACs at the request of ELEPHANT.^{6/}

U.S. FACs were used in TIGER HOUND and Operation CRICKET plus all CAS missions (specified targets when required by U.S. Embassy Vientiane), and all targets located within five kilometers of the Cambodian Border in the southern Laos area. A RLAF FAC was available to assist in attacking any authorized target. The FAC team in northeast Laos was composed of: an US FAC to control jet aircraft; a Thailand FAC to control T-28s; a Meo (Laotian tribesman) familiar with the terrain and ground disposition; a Laotian who spoke Meo and Thai; a civilian pilot; and an interpreter for the four languages.^{7/}

In all areas of Laos, positive visual identification of the controlling aircraft and continuous two-way UHF communication was mandatory, if airborne

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control were used. Continuous two-way UHF communication was usually mandatory for the ground FACs; however, voice authentication was not required in either case. Night FAC controlled missions were authorized to expend ordnance without direct UHF radio contact, if the FAC had continuous UHF contact with the flare aircraft and the flare aircraft had continuous UHF contact with the strike aircraft.^{8/}

Under the TIGER HOUND concept, a special task force was created at Tan Son Nhut and originally had operational control of 10 USAF and 10 Army O-1 aircraft manned by 30 USAF crews. It also had 13 Army Mohawks (OV-1As and Bs) manned by Army crews. All aircraft staged from four South Vietnam airstrips (Dong Ha, Khe Sanh, Kham Duc, and Kontum) close to the Laotian Border. The Mohawks were used to discover targets at night with IR/SLAR and to perform VR in more remote areas.^{9/}

The effectiveness of the sensor-equipped aircraft was proved in March 1966. The 13 TRS Photo Interpreters noticed suspicious returns on "first light" infrared pictures along Route 9, approximately two and one-half nautical miles east of the Tchepone crossing of the Sepone river. Seven returns were in a line, which was thought to indicate a convoy. This was reported as a "hot item" and reached an airborne FAC in the Tchepone area. Instead of leaving the search area at his regular time, the FAC decided to loiter and attempt to verify the report. Approximately 30 minutes later, he spotted vehicles beginning to leave hiding places among the trees and apparently preparing to move out. Strike aircraft were called in to hit the area where the

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trucks were seen and 39 vehicles were destroyed or damaged with several secondary fires.^{10/}

Even though the IR did not pinpoint the truck park, it did point to a general area in which they might be found. This, coupled with the perserverance of the FAC and an excellent strike, made it possible for TIGER HOUND forces to run up their biggest score to date.^{11/}

In April 1966, TIGER HOUND FACs had their biggest success of the five and one-half month-old program. Truck kills continued to increase with 325 destroyed and 205 damaged. Secondary explosions reached 442. The enemy was making a determined effort to defend his truck resources as there were drive-in truck revetments and bunkers built into the sides of mountains along Routes 92 and 96.^{12/}

In addition to the trail infiltration, observations by FACs in the first week of September 1966, disclosed an ever increasing change in enemy methods. He was beginning to rely heavily on river boats to transport supplies. Indications were that the change to watercraft was necessary since the motorable roads remained impassable and supplies were needed by their forces to the east. While the FACs were reasonably certain the water movement was transporting enemy supplies, gaining approval to strike was another matter. Within the Rules of Engagement, it was nearly impossible to definitely ascertain that the boats actually were transporting military supplies.^{13/}

Attempts were made to secure approval to hit the river traffic and the USAIRA, Vientiane, authorized a modification to the basic Operations Order.

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This change authorized strikes, under positive FAC control, on large military type boats and barges operating on rivers or beached on shores within the STEEL TIGER armed reconnaissance boundary lines. Strikes against long, narrow beam boats were not authorized. The problem was not solved, as there was still no way to accurately determine the intentions of the majority of the boat traffic which was of long, narrow beam construction. ^{14/}

Although the first six months of TIGER HOUND were the most productive, the cumulative results by the end of 1966 were impressive. Statistics for the operational period are as follows: ^{15/}

<u>Trucks</u> <u>Dest/Dam</u>	<u>Roads Cratered</u> <u>or Seeded</u>	<u>Landslides</u>	<u>Enemy KBA</u>
938/576	1850	184	403
<u>Structures</u> <u>Dest/Dam</u>	<u>Watercraft</u> <u>Dest/Dam</u>	<u>AAA/AW PSNS</u> <u>Dest/Dam</u>	<u>Secondary</u> <u>Explosions</u>
4120/1388	33/16	125/70	1717

Complementing the TIGER HOUND procedures was the interdiction concept employed in the CRICKET program which was begun in early 1966. (Fig. 1.) In this procedure, targets were obtained as a result of airborne FAC and ground Road Watch Teams. The Road Watch Teams communicated with the FAC as well as with Vientiane. The FAC had the capability to communicate with the TACC at Udorn through relay aircraft and Nakon Phanom. In turn, the Udorn TACC usually requested airstrikes from the TACC at Tan Son Nhut. ^{16/}

The CRICKET aircraft were manned with USAF pilots and Laotian observers to perform close surveillance in relatively small and inaccessible areas

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associated with lines of communication (LOC). The ever-increasing knowledge of the terrain by the pilot and observer, coupled with sophistication of the reporting system and quick reaction to the Road Watch Teams and CAS intelligence, produced good results.^{17/}

To provide the framework for CRICKET, six experienced FACs from South Vietnam and five O-1F aircraft were originally assigned at Nakhon Phanom. In early February 1966, the unit was augmented with six pilots and five more aircraft. By April, the organization had 24 pilots and 20 O-1s. Personnel continued to arrive and the unit was designated the 23d Tactical Air Support Squadron (TASS) on 1 June 1966. Four AC-47s were deployed to Nakhon Phanom in February and were used entirely at night as flareships, gunships, and FACs. By July, the area became nonpermissive and the AC-47s were replaced by A-26s.^{18/}

In response, the enemy strengthened his air defense effort and eventually effectively denied Mu Gia Pass and Tchepone to FAC operations. Soon, two O-1s and pilots were lost to ground fire. As the enemy became more adept at countering, a tactics board consisting of CRICKET officers was formed to review existing operations and to plan for necessary revisions. The board pointed out several deficiencies:^{19/}

- Continued strikes against RLAF targets were no longer productive.
- The enemy's capability to rapidly repair or bypass bridges and underwater crossings made them virtually ineffective as targets.
- The use of large numbers of strike aircraft and ordnance on trucks, with the exception of convoys,

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was an uneconomical utilization of the limited resources.

- Aircraft and ordnance were not designed to meet the requirements of the operations. It was often necessary to drop 3,000 lb. bombs on small bridges or suspected truck parks. This normally occurred with diverted strike aircraft.
- Bombs being used were exploding on contact with trees resulting in little or no cratering. The fuzes needed a longer delay.
- The airstrike effort had been scattered, divided, and at times haphazard.

As a result of the board's findings the outmoded strategy was changed to one of concentrated air effort against selected segments of the route structure, including seeding with small, time delay bombs, intended to harass road repair crews. The strategy was effective, but again air defenses were strengthened until the area was considered nonpermissive for the C-47s, and ^{20/}there was a sharp rise in ground fire directed at the CRICKET O-1s.

Through January 1967, the USAF continued to wage a campaign in Laos directed primarily at interdiction. In the latter part of the dry season, selective programs called SLAM and SHOCK, in addition to regular operations, were initiated. Generally, SLAM operations were directed against NVN troops in northwestern South Vietnam, but in two periods, January and March 1967, SLAMs were placed in STEEL TIGER. Divided into two phases, detect and strike, the SLAM program was flexible enough to run for extended periods; however, the strike phase was generally envisioned as lasting 36 hours and was controlled by FACs. ^{21/}

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A SHOCK operation was a small SLAM (omitting B-52s and other Service strikes) applied to Laos. Four SHOCKs were carried out in 1967:^{22/}

<u>NUMBER</u>	<u>DATES</u>	<u>TARGET AREA</u>
SHOCK I	27 Apr - 30 Apr	Route 110
SHOCK II	20 May - 27 May	Route 110
SHOCK III	30 Jun - 4 Jul	Se Kong River (east of Saravane)
SHOCK IV	26 Dec - 30 Dec	Routes 110, 95, 165

The area of SHOCK for route 110 was partitioned into three FAC controlled sectors: One sector was allocated to RLAF T-28s; one to USAF prop-driven aircraft and the RLAF; and one to any USAF/RLAF strike aircraft. Two USAF O-1s were deployed to Attapeu and a special command post was established to maintain contact with FACs, the airborne command center, AIRA at Vientiane, Savannakhet, and CAS. The SHOCKs were considered successful and in February 1968, SHOCK V was launched. Although it produced less destructive results than earlier operations, enemy activity in the area declined considerably.^{23/} SHOCK activity was curtailed for the remainder of the 1968 dry season.

The three main methods of target acquisition involved FACs, Road Watch Teams, and the STEEL TIGER Task Force, which evolved into Task Force Alpha with the MUSCLE SHOALS/IGLOO WHITE system. In a message to COMSEVENTHFLT,^{24/} CINCPACFLT commented on strikes in Laos which were guided by USAF FACs:

"It is realized that airborne FACs provide the most effective means of coordinating interdiction against the flow of enemy war materials into SVN. Accordingly, all diverts into Laos should continue utilizing FAC

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control as a primary source of target acquisition."

Unquestionably, FACs were the hub of the USAF interdiction in Laos. They visually acquired targets, contacted the airborne command center, and directed the strikes. However, the bulk of the enemy trucks moved at night, with the rugged terrain, enemy defenses, weather, and heavy vegetation aiding the enemy, while hindering the FAC program.

To counter the truck movement at night, six UC-123s (Candlestick) and six C-130s (Blindbat) were employed in Laos. The operation proved to be extremely successful, as their average truck sighting was greater than either the O-1 or O-2. The primary mission of Candlestick and Blindbat was to perform unarmed night reconnaissance and FAC duties on specific road segments. Their secondary mission was to perform psychological operations in Laos and logistic support in Thailand and South Vietnam.^{25/}

Based on current data, the C-123s capability for sighting trucks exceeded that of the O-2 or C-130 aircraft. During the period November 1967 to August 1968, strike aircraft controlled by Candlestick crews accounted for more than 50 percent of the total in STEEL TIGER, with a record of 47 truck kills in a single night and an overall average of 12. Also, the C-123 averaged more than six hours on station, an endurance which permitted more thorough traffic following and target development than the O-2.^{26/}

Three navigators were assigned each Candlestick mission, two operated Starlight Scopes and one performed normal navigator duty. A single Starlight Scope was mounted on the floor of the aircraft and manned by a navigator lying

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TALLY HO

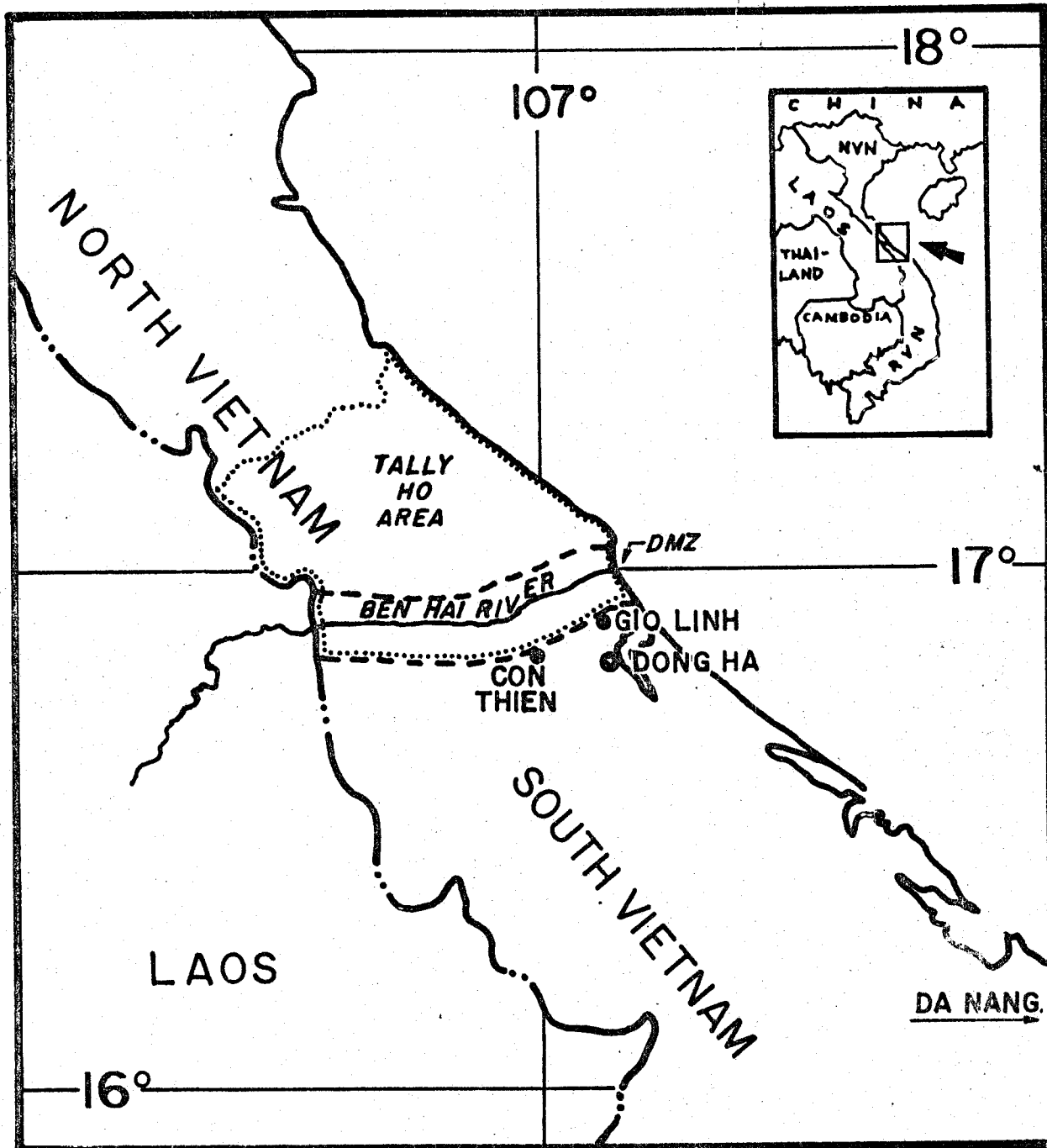


FIGURE 2

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prone on a mattress and protected by steel armor. This mounting appeared more effective than the side mounted scopes. To ease the manpower pinch on navigators, a program was initiated to train enlisted men in the use of the scope. This program was soon abandoned as it was determined that the task required rated crew members.^{27/}

The large cubage and long endurance of the C-130 aircraft were especially well-suited to certain out-country SCAR missions. Of particular advantage was the infrared device, which allowed the Blindbat to maintain contact with targets that left the road to park in shadows, under light vegetation, or other types of cover. To increase their capability, 7AF suggested that the C-130s be converted to gunships. In this configuration they would perform the dual function of SCAR and strike. There were several advantages to that course of action. In the long term, the overall interdiction capability would be significantly increased. In this configuration, the AC-130 could attack and fix targets until other strike aircraft arrived. If no strike aircraft were immediately available, the AC-130 would sustain the attack until strike aircraft became available.^{28/}

North Vietnam and the DMZ

Operation TALLY HO was initiated on 17 July 1966, with the first air-strikes occurring on 20 July. Implementing similar principles as those used in Laos, the TALLY HO program was basically designed to interdict enemy forces infiltrating through the Demilitarized Zone (DMZ). (See Fig. 2.)

The TIGER HOUND staff also managed TALLY HO and utilized the same four

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outlying sites at Khe Sanh, Kontum, Dong Ha, and Kham Duc. The concept of TALLY HO hinged on VR performed principally by airborne FACs flying in pairs in O-1Es. The northward range was eventually extended with the use of A-1Es and U.S. Army OV-1 SLAR aircraft.^{29/}

FACs were assigned to the mission on a temporary duty status and were selected from all four of the TASS units in Vietnam. They received a one-month curtailment for 20 out-country missions, but to preclude the rotation of excessive numbers of FACs, the Commander, 7AF, restricted the TALLY HO FACs to a 50-mission limit.^{30/}

As it was known in advance that the TALLY HO area was heavily defended, O-1s were fragged only in permissive areas. The survivable area was established in the western mountainous region, with only tentative probing into the eastern sector. This limitation had definite drawbacks as the coastal portion of TALLY HO contained the principal motorable routes, while the mountainous terrain in the west was heavily canopied and contained less lucrative targets. Further, in the TIGER HOUND area, the FACs flew just above the tree tops; conversely, in TALLY HO they were required to fly at 1,500 feet, which lessened their effectiveness.^{31/}

By mid-1966, the enemy began to flank the FAC-controlled area of TALLY HO to the east and west, and FACs were finding targets harder to pinpoint, as the enemy found havens for his activities in the numerous small villages to the east of Route 102. In September, there was general concern that the enemy was preparing for an offensive. In preparing for this contingency, 7AF

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developed OPORD 458-67, "GRAND SLAM". It proposed the employment of a concentrated 36-hour air attack centered around target areas in the DMZ. Preparation was to begin with a large B-52 force striking the area at first light. FACs were then to VR the area, discover targets, and control tac air. Eight fighters were scheduled into the target area every 15 minutes during daylight hours, and two fighters every 15 minutes during the night. ^{32/}

On 16 September, the B-52s dropped on schedule and FACs were over the target at first light. A lack of suitable targets to develop, however, and deteriorating weather postponed the operation. For the remainder of September, TALLY HO aircraft concentrated on interdicting truck traffic and seeking out storage areas. The night program was expanded to include FAC control. Expectations for the night FAC program were high, but experience quickly revealed definite limitations. ^{33/}

The realization that nearly all of the enemy transport was being accomplished at night led to the execution of an extensive night program. For target acquisition, four methods of detection were employed: the spotting of trucks driving with lights on; flare illumination; SLAR; and the Starlight Scope. Targets could be detected by any of the four methods, but each had a limiting factor: ^{34/}

- During periods of moonlight, trucks were driven at speeds of 20 - 30 mph with lights out.
- Flare illumination caused many shifting shadows and provided the truck drivers warning of impending attack.

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- SLAR aircraft could detect movement, but were unable to tell what the movement was, or its location, without flare illumination.
- The Starlight Scope was only effective during periods of full or near full moon.

While trucks could be seen, marking and pinpointing their location for the strike pilots was another matter. If flare illumination were employed, the drivers usually had sufficient time to drive off the road and conceal themselves in the shadows or foliage. Generally, such evasive action also concealed his position from the FAC. Further, large truck convoys were never observed, and the widely spaced vehicles did not present a lucrative target. ^{35/}

From the onset of TALLY HO operations, the survivability of the O-1E in the hostile environment of North Vietnam was a matter of concern. AAA/AW fire appeared to be the biggest threat. FAC aircraft were directed to avoid known areas of heavy defense, probe cautiously, and employ a "roll back" technique whenever enemy fire was encountered. The "roll back", although it increased survivability, was not successful because it confined FACs to the more permissive, but less lucrative western area. Furthermore, there were also strong indications of a southern deployment of missiles (SAMs). ^{36/}

Increased enemy military activity was noted by the FACs in November 1966, and forwarded in their daily intelligence summary. COMUSMACV was briefed on the FAC estimate and as a result, a study group was formed to ascertain the degree of increased activity, and the enemy's probable intentions and capabilities. Various conclusions were reached. The significant one concerning FAC activities was: "Due to the vulnerability of the O-1 aircraft, restrictions have been placed on the area in which FACs are permitted to operate.

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These areas are continuously under review and are expanded when our analysis indicates that the AAA/AW environment will allow us to do so. Recent battle damage sustained in southern portions of TALLY HO-DMZ indicates that we are presently at the safe operating limits for the O-1." ^{37/}

Misty FAC

With the TALLY HO area becoming increasingly non-permissive for low and slow aircraft, the next significant step was the introduction of the F-100 Misty FAC. The use of three F-100F aircraft in Route Package One/TALLY HO, to function as extensions of the airborne command and control element by conducting forward air control, VR, and armed reconnaissance was approved by the Commander, 7AF, on 17 May 1967. Aircraft were to be flown out of Phu Cat, Vietnam, by the 37th TFW and configured with: two LAU-32 B/A rocket launchers; 14/2.75 white phosphorous rockets; 2/335 gallon external tanks; 20-mm ammunition; they would conduct aerial refueling as required. ^{38/}

Initially, three sorties per day were scheduled, along with a requirement of approximately 450 hours per month. The operation was to continue through the summer monsoon season of June through October. If the concept produced the expected results, 7AF envisioned approval of a higher sortie rate with a consequent requirement for more F-100F aircraft. However, the Commander, 7AF, did not want to withdraw any more F-100Fs from 7AF squadrons. ^{39/}

Again, the parallel between Korea and SEA became evident. As in Korea, procedures, tactics and operational concepts had to be developed and refined on the spot. One of the first pilots assigned to the Misty FAC program stated in his End of Tour Report: ^{40/}

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"Upon my arrival at Phu Cat Air Base on 16 June 1967, I was introduced to the Project Officer, Major Douglas. My immediate impression was one of awe at the amount of work to be done. The only direction Major Douglas had been given was to set up a program to employ the F-100F as a forward air control vehicle in North Vietnam. The immediate problem at hand was training...on each mission we experimented with altitudes, airspeeds and tactics... By the time of the first flight over North Vietnam on 28 June we felt mentally prepared for the job...After about two weeks of looking, suddenly we started finding trucks and supplies. On the first occasion that a pilot decided to refuel twice so that he could call in fighters to destroy a lucrative target, a precedent was set and two refuelings became the standard."

During August and September 1967, Battle Damage Assessment increased significantly and the ability of the F-100F to find, mark, and control strikes on camouflaged and fleeting targets in a hostile environment was proved beyond doubt.

In August 1967, the Commander, 7AF, commented on the role of the F-100 FACs in TALLY HO: ^{41/}

"I talked to the F-100 FACs. They are very enthusiastic about the mission. As they get more familiar with the territory, I am convinced they are going to be even more effective. They tell me they are locating trucks in small numbers, but haven't had strike aircraft available... I looked at some hand-held photographs taken from the back seat of an F-100F. They looked pretty good to me. Admittedly, they are not as good as those taken by the O-1s, but nevertheless usable. We need to exploit this capability. I wish you would issue the necessary instructions requiring the use of these hand held cameras on all FAC missions."

Evidence continued to mount indicating that strike pilots were unable to see or identify targets during armed reconnaissance. The Misty pilots were drawn from highly qualified experienced fighter pilots, but historically, 20

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FAC missions were required to train the crew member, and he was not considered highly qualified until after 40 missions. The strike pilots with limited fuel for road reconnaissance, and with no training in visually acquiring small, camouflaged targets, were relatively ineffective. For example, fighter pilots with wide experience over Vietnam, flew orientation missions with Misty FACs and subsequently realized they did not know what small targets, such as camouflaged trucks, looked like. One strike pilot, with more than 30 missions as a flight leader in Route Package I, after a Misty orientation mission, stated that he saw a gun site and a truck for the first time, even though he had struck both types of targets many times.^{42/}

As a result of the successful application of F-100Fs as FAC aircraft in the highly defended areas of Route Package I and TALLY HO, the Commander, 7AF, requested action be taken to increase the scope of operation. The Air Staff concurred in principle; however, no F-100F aircraft were available from USAF worldwide resources outside PACAF. Other Commands reported less than required numbers of F-100Fs on hand. For example, TAC stated that no F-100F aircraft could be drawn down without significantly reducing student production in fiscal year 1968. They stated that a reduction of four aircraft would result in a reduction of 30 students. Consequently, PACAF's suggested alternatives to 7AF were:^{43/}

- Establish a detachment at Phu Cat Air Base, Vietnam with 12 or more F-100Fs from within their own resources.
- Utilize Combat Dragon (A-37) aircraft.

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The mission of the Misty FACs required air-to-air refueling to achieve the desired operating time. KC-135 aircraft from the 4258th Strategic Wing provided this support. Five tankers were required to support the mission profile, and since the inception of the program in June 1967 until 30 September 1968, a total of 31,529,300 lbs. of fuel was offloaded in 3,561 ^{47/}refuelings.

Active interest began in developing a night Misty program during the summer of 1968. Advocates of the night program found attentive ears as the truck movement had almost completely ceased during daylight hours. The first night sortie was flown on 12 July 1968, and in slightly over one month, Misty pilots developed night tactics and investigated several significant areas. By August, 46 night sorties were flown to evaluate the night capability. The results indicated that the F-100F was comparatively ineffective in a night ^{48/}FAC role and better utilized in daylight for the following reasons:

- The F-100F has a very limited navigational capability and must rely upon TACAN fixes and visual means to locate target areas. This inhibits target location and fighter/FAC rendezvous at night, particularly in mountainous areas where weather is a factor.
- The F-100F has a limited flare capability, in that it only carries two SUU-25 flare pods of eight flares each, hence, search and target identification capability is limited.
- The operational evaluation of the miniature Starlight Scope in the F-100F for detection of truck traffic did not prove to be as effective as originally thought.

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Stormy FAC

As mentioned previously, the F-100F was a limited resource and, as high performance FAC aircraft had proved its worth in a nonpermissive environment; therefore, it was logical to test and evaluate the F-4. On 9 March 1968, the 12th TFW was directed to conduct an operational test of one F-4 in TIGER HOUND/TALLY HO/Route Package I. A Misty pilot was to occupy the rear seat to instruct in procedures and critique techniques. By 20 March, ten sorties had been flown and each mission profile was programmed in the same manner, at the same altitudes, and with similar ordnance as the Misty missions.^{49/}

The overall observation by the 12th was that the F-4 could be used effectively as a FAC aircraft in a similar role as the F-100F, if tanker support were provided for multiple recycling. The two engine reliability was a definite advantage, as was the added thrust. Further, the airframe had adequate ordnance-carrying capability with 20-mm guns and two LAU 59s that held 14 marking rockets. Radar Homing and Warning equipment, which was highly desirable when operating in Route Package I, was an integral part of the F-4 avionics. As predicted, visibility from the rear seat was restricted by the forward canopy attachment, high canopy rails, and large engine intake. Also, the time over target was less than that of the F-100F due to high fuel flow at low altitudes.^{50/}

At a conference on 29 June 1968, Commander, 7AF, requested the 7AF Director of Operations to examine the feasibility of utilizing the F-105F Wild Weasel aircraft to provide additional FAC sorties in the TALLY HO/Route Package I area. This request was in anticipation of a possible surge requirement in support of the upcoming SLAM Operation THOR, which was programmed to

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begin on 1 July. Combat experienced F-105F aircrews stated that visibility from the rear cockpit was poor and that maneuvering was marginal at low altitude whenever the airspeed fell below 400 kts. To maintain such a high speed would negate acquiring suitable targets. Moreover, Wild Weasel equipped F-105F aircraft and trained crews were a very limited resource, the loss of which could be expected to increase if assigned the FAC mission.^{51/}

In view of these factors, the 7AF Director of Operations recommended that Wild Weasel aircraft not be assigned the FAC role, but that F-4 aircraft from the 366th TFW at Da Nang be assigned the mission. The 7AF Commander agreed: "Use a couple of F-4s from the 366th to start a program."^{52/}

On 27 July, 7AF tasked the 37th/366th TFWs to initiate a joint training program to develop an F-4 FAC capability in Route Package I within the 366th TFW. Both units were required to submit interim and final reports on the program, including comments and recommendations regarding the feasibility of the employment of the F-4 in this role in the future.^{53/}

A joint training program began on 12 August, which consisted of five F-100F back seat FAC missions and three front seat F-4 FAC missions. Training was completed on 26 August and reports from the 366th TFW and 37th TFW indicated that the F-4 would be an asset to the FAC program in North Vietnam. Nicknamed "Stormy", the 366th TFW was fragged for two FAC missions per day starting on 2 September. Initial Battle Damage Assessment and Daily Intelligence Summaries indicated that the Stormy FAC program was successful and had resulted in the acquisition and destruction of lucrative targets.^{54/}

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The 366th TFW Stormy FAC program experienced several advantages over the 37th TFW Misty FAC program. The most important one was that any aircraft in the 366th Wing could be rapidly converted to the FAC role, which solved the limiting problem of aircraft availability. Further, the 366th had an out-country mission which allowed the Stormy FACs to disseminate intelligence sightings to the strike pilots rapidly and personally. Important targets and enemy defenses were ground briefed by the FACs. This hunter-killer concept provided more effectiveness with less risk.^{55/}

Summary

The out-country FAC controlled interdiction program begun in Laos in late 1964, and subsequently expanded to include the southern portion of North Vietnam in mid-1966, became increasingly less permissive for the low and slow FACs. As the enemy increased his air defense capability, the C-47s were withdrawn and eventually the O-1s were operating on the limits of safety. The introduction of O-2s in the semi-permissive environments and tac fighters in the nonpermissive areas increased effectiveness and reduced risk.

The bombing halt resulted in approximately 620 Air Force, Navy, and Marine strike sorties being fragged into Laos each day. This represented an increase of 480 over the daily strike figure prior to the halt. An increase of that magnitude required a substantial increase in the number of FACs needed to acquire targets and control strikes. The following is a summary of O-2 FAC requirements needed to support the effort.^{56/}

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<u>BASE</u>	<u>DAY</u>	<u>NIGHT</u>	<u>SPECIAL</u>	<u>TOTAL SORTIES REQUIRED</u>	<u>TOTAL ACFT REQUIRED</u>	<u>ACFT ASSG</u>
NKP	22	10	8	40	47	28
UBN	5	5	0	10	12	11
DNG	5	4	6	15	18	12
PKU	5	4	2	<u>11</u>	<u>13</u>	<u>10</u>
			TOTAL	76	90	61

Since the bombing halt, the jet FACs devoted a major portion of on-station time familiarizing themselves with Laos. The Misty intelligence summaries indicated that few significant sightings and strikes were controlled by them since the halt. Stormy FACs served in the search and rescue force in support of special reconnaissance missions. At the 7AF Interdiction Conference, it was recommended that jet FACs be integrated into the Northeast Monsoon interdiction effort to supplement the slow mover FACs, and replace them if portions of Laos became nonpermissive.^{57/}

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CHAPTER IV
IN-COUNTRY OPERATIONS

After Operation NIAGARA (Khe Sanh) ended on 31 March 1968, the Commander, 7AF, continued to emphasize the effective application of tactical airpower against lucrative targets throughout South Vietnam. Therefore, a proposal was submitted to COMUSMACV that certain designated areas in South Vietnam containing major lines of communication used by the enemy be designated specified strike zones (SSZ), so that an Air Force controlled interdiction program could be carried out.^{1/}

In late March, 7AF also directed appropriate Direct Air Support Centers to obtain strike areas where strikes could be put in under FAC control without further clearance. Six areas of special interest in I Corps, and II Corps were suggested, two of which ran through the A Shau valley. In addition, the Tactical Air Support Squadron in each of the Corps was directed to fly visual reconnaissance in the target area at least once a night and to request immediate approval for strikes on lucrative targets.^{2/}

This latter procedure used normal channels in securing approval of the appropriate ground commander and the Vietnamese. Exception from this requirement was sought in obtaining strike areas where FAC-controlled airstrikes could be put in without further clearance. On 30 March, III Marine Amphibious Force informed 7AF that harassment and interdiction would be considered the same as close air support, and would be processed through the appropriate ground commanders. In early April, 7AF responded by reiterating that MACV had no plans to provide 7AF with clearances and free strike zones for an

SPECIFIED STRIKE ZONES

• VICTOR

• TANGO

• UNIFORM

• BRAVO

NVN

RTE 1

HUE

VICTOR

922

548

614

DA NANG

TANGO

4

534

14

LAOS

966

UNIFORM

RTE 1

SOUTH
CHINA
SEA

BRAVO

I CORPS

II CORPS

14

FIGURE 3

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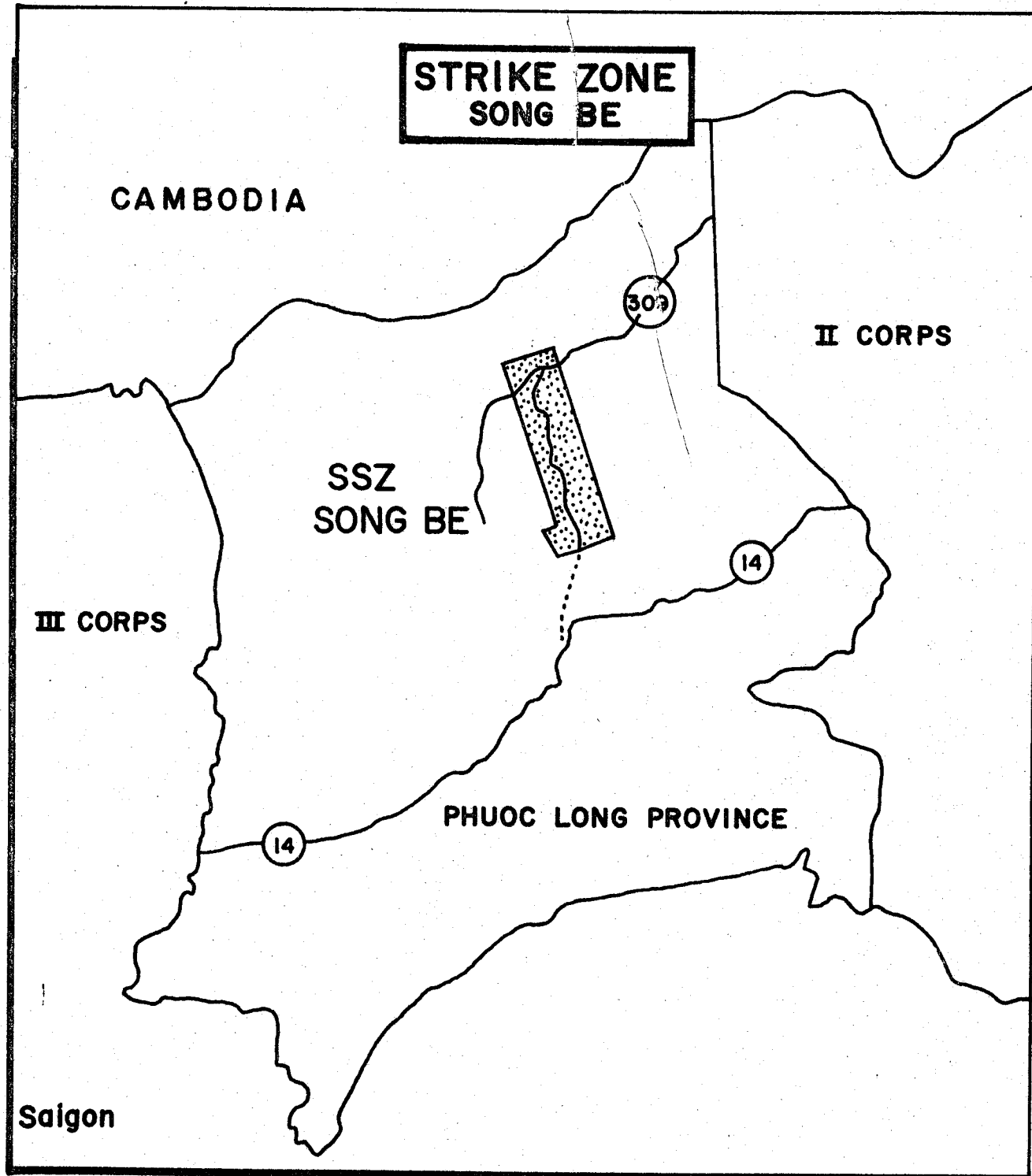


FIGURE 4

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in-country interdiction program. Therefore, 7AF would strike enemy lines of communication in-country after receiving individual strike requests from MACV, through the Tactical Air Support Element.^{3/}

In mid-April COMUSMACV considerably broadened the in-country interdiction program:^{4/}

"In the furtherance of this effort (interdiction) COMUSMACV has authorized direct coordination between 7AF and major field commanders for the identification of targets and the establishment of specified strike zones as set forth in MACV Directive 95-4. In order to ensure flexibility for the air interdiction campaign, ground commanders would establish specified strike zones and authorize 7AF to direct strikes into those areas on sustained around the clock basis without further political clearance or tactical approval."

The SSZs gradually expanded and by 1 November 1968, there were a total of five: Victor, Tango, Uniform, Bravo, and Song Be. (Figs. 3 and 4.) The FACs who acquired targets and directed strikes were assigned to either the ARVN or U.S. Army with no distinction attempted; however, the bulk of the effort was assumed by the ARVN FACs.

Song Be

Base area 531, situated in the northeastern portion of Phuoc Long Province was historically a sanctuary for the enemy. In early March 1968, a road under construction, and wide enough to handle truck traffic, was discovered in that vicinity. The road was dubbed the Song Be road and, if left open, would provide a link between Routes 309 in the north and 14 in the south, thus giving the enemy a through access to southern III Corps and

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War Zone D. On 18 May, 7AF obtained a SSZ from the Commander, 2d Field Force, which enabled Air Force units to strike this vital enemy link.^{5/}

The first strike occurred on 9 May, and after two weeks of effort, the road was considered unusable--enemy workers moved out of the area. Since it took only a minimum effort to keep the road closed, special arrangements were made with the U.S. Army and ARVN commanders to obtain an expanded strike zone in which FAC-controlled strikes could take place. In this approved area just north of Song Be, sorties were fragged directly to the FACs.^{6/}

The FACs soon developed a highly successful and personalized program. They acquired and struck targets developed by their VR in Song Be, and in the other SSZs. A staff officer in 7AF stated that when fragging into the SSZs, they would often turn the strike aircraft over to the FAC without specifying a target. This was done because the FAC had the most up to date and current information.

Further, there was an obvious motivation factor if the FAC knew that the targets he acquired were going to be struck.

Between 19 May and 24 October, 285 strike sorties were flown in the Song Be area. In addition to these, 476 sorties expended munitions over targets throughout Phuoc Long Province for an average of some six interdiction sorties per day during the five month period. The Battle Damage Assessment in the Song Be SSZ was quite impressive: secondary explosions 136; secondary fires 180; killed by air 157; bunkers destroyed 545; bunkers damaged 299; foxholes destroyed 67; foxholes damaged 49; tunnels destroyed 4; tunnels damaged 5;

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trenches destroyed 576 meters; road cuts 40; trail cuts 18; bridges destroyed 4; bridges damaged 13; gun positions destroyed 19; gun positions damaged 8; structures destroyed 154; structures damaged 111; sampans destroyed 10; sampans damaged 6; and trucks destroyed 8.^{7/}

Victor

On 31 May 1968, SSZ Victor was established in the A Shau valley in I Corps. Victor contained Route 548, an extension of Laotian Route 922, which essentially ran down the middle of A Shau and had been enemy controlled almost continually since the fall of the A Shau Special Forces Camp in March 1966. In early June 1968, the first airstrikes were conducted and have since run continuously, only interrupted by weather. The terrain in Victor was mountainous; however, Route 548 was built on the floor of the valley and was extremely difficult to keep closed. An extension of 548 in Laos was first observed by an Air Force FAC in March 1968. Subsequent VR missions confirmed that the road had been extended across the border into South Vietnam.^{8/}

With the exception of Operation DELAWARE in April and May 1968, friendly ground troops had not occupied the A Shau valley, thereby making it an ideal SSZ. As such, FACs were the primary source of intelligence regarding enemy logistic and troop movements in Victor.^{9/}

Tango

On 20 May 1968, SSZ Tango was superimposed over Route 614, astride the main infiltration route between Laos and Da Nang. The first airstrikes started on 22 May, and by August the road had been effectively interdicted. Nevertheless, there could be little doubt that the enemy would rebuild this vital

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line of communication if allowed to do so. If 614 and its extension were improved, they would probably proceed on toward Da Nang, or move south toward Thuong Duc Special Forces Camp, where previous enemy probes had shown a determination to overrun the air strip and camp. ^{10/}

Uniform and Bravo

On 20 December 1967, an extension of Route 966 in Laos was detected, and by January 1968, construction efforts had extended the road into South Vietnam. The road soon intersected the Vietnamese national Route 14, close to the I/II Corps border. No activity was noticed on Route 14 until early May, when Kham Duc was attacked and fell. The enemy immediately began to repair Route 14 north toward Thuong Duc and Da Nang. On 20 May, III Marine Amphibious Force elected to use its air units to close the road. The Marines concentrated on a specific segment of the route, and strikes were conducted within 200 meters of either side of the road. However, they soon realized that to deny the enemy total use, an additional interdiction effort was required. ^{11/}

On 9 July, SSZ Victor and Bravo were designated by the Marines, and 7AF strikes were then conducted in the area under FAC control without utilizing the normal channels. Although the enemy attempted to bypass interdicted points, only short segments remained open to vehicular traffic, and there were no reports of movement subsequent to August 1968. ^{12/}

Sorties

The sorties allocated for the in-country interdiction program were drawn from the designated 7AF "Special" category. Generally 40 sorties were set aside daily to support the herbicide, cargo escort, and interdiction programs.

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Of this figure, approximately 20 sorties, which represented four percent of 7AF's total daily sorties, were apportioned to the interdiction effort in Special Strike Zones Victor, Tango, Uniform, Bravo, and Song Be.^{13/}

Rocket Watch

After the onset of the rocket attacks on Saigon and Tan Son Nhut in February 1968, a night interdiction mission named "Rocket Watch" was initiated, using the limited O-1 equipped FACs assigned to the Capital Military District (CMD). By 11 June, a more formal and controlled Rocket Watch program, using "Sleepy Time" FACs with O-2s operating from Bien Hoa, went into effect. Four corridors were established around Saigon at the cardinal points to box in the city. The O-2s patrolled the Saigon/Tan Son Nhut area nightly from 1900-0700 using the Starlight Scope. Three of these corridors were patrolled by U.S. Army helicopters, but they were soon withdrawn due to other operational commitments, and the USAF O-2s assumed the entire Rocket Watch mission.^{14/}

Completing the USAF team was an AC-47 (Spooky) which appeared on station from 1930 to 0630. In constant contact with both the ground controlling agencies and the FAC, Spooky provided immediate firepower as well as increased visual coverage. Spooky and the FAC coordinated very closely in the relatively confined area, with Spooky holding at approximately 3,700 feet and the FAC at 3,000. Ancillary benefits accrued as a result of an airborne Spooky being in the Tan Son Nhut area. The most obvious was his ability to react rapidly against enemy incursions on Tan Son Nhut and Bien Hoa, while still on call anywhere in the CMD.^{15/}

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The FACs assigned to the Rocket Watch were normally not intended to be used for purposes other than directing strikes against active rocket sites (they were non-fighter qualified). Nonetheless, in emergency situations it was envisioned that they would direct close air support for friendly troops in contact. It should be noted that as well as requiring night strike control, the CMD was heavily populated, with military and civilians. Furthermore, FACs provided the CMD artillery units with many fleeting targets, and when the mission permitted, Sleepy Time FACs patrolled the western and northern areas of III Corps in a night search role. In this secondary mission, they found and directed strikes against trucks, sampans, ox carts, VC concentrations, and ferry points. Also, they came to the defense of outposts under attack by directing artillery and airstrikes against enemy forces.^{16/}

In the night interdiction role, the Sleepy Time FAC proved to be a valuable asset in III Corps. The original concept of Rocket Watch, however, was no longer valid by late 1968 for two reasons. First, intelligence sources indicated that rocket launch sites were usually unmanned as the enemy had developed an inexpensive timing device to affect the firing, leaving only the two aiming sticks at the site after the launch. Thus, the site was not a valid target after firing. Second, there was an extreme clearance problem which prevented efficient and rapid reaction to enemy ground assaults and missile firings. During July, approximately one third of the requests for clearances were approved and executed; the rest were denied by one or more of the clearing agencies. Airstrikes were often diverted or cancelled because previously granted clearances were rescinded.^{17/}

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The Sleepy Time mission could no longer be considered a retaliatory force. Rather, it was viewed by 7AF as a search and warning force with an interdiction capability. As this became more and more obvious to the U.S. Army in command of the CMD, 7AF hoped that the Rocket Watch requirement would be reduced to enable more sorties for the night interdiction role.^{18/}

Summary

The ARVN, U.S., and Free World Forces possessed the greatest freedom of movement in Vietnam since the introduction of North Vietnamese troops. During ground sweeps and long range patrol activity, large caches of enemy supplies were confiscated. Realizing that the enemy must establish base camps, improved lines of communication, and storage areas to support the introduction of large amounts of troops, an intensified interdiction program could further weaken or destroy his capability to launch offensive actions.^{19/}

With the exception of the few SSZs previously mentioned, the interdiction program was extremely limited as the Commander, 7AF, was not authorized to strike interdiction targets in-country unless they were approved by the appropriate ground commander. The increase in enemy weapons defending base camps, lines of communication, and supply areas had identified the enemy's dependence upon external sources for ammunition, weapons, and ancillary command and control. His construction of more and better roads, plus increased use of trucks and sampans, brought about momentary concentrations of equipment and troops which could be engaged in decisive action by airpower.^{20/}

The in-being intelligence organization within the ARVN Divisions had the

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capability to effectively generate targets against these enemy concentrations.

This capability relied heavily on the U.S. FAC, who provided aerial surveillance for both ARVN and Regional Forces operating at district and hamlet level.

- The VR responsibility rested with the U.S. Army Senior Advisor as outlined in MACV Directive 381-1. The Senior Advisor was directed to "Develop in coordination with the Senior USAF ALO, ARVN, and aircraft company commander, detailed surveillance plans to implement a program within his area of responsibility."^{21/}

To take advantage of the ARVN capability, 7AF Director of Plans proposed two primary objectives: First, to destroy the logistical base supporting the enemy operations and second, to destroy or harass his command and control structure. To achieve the stated objectives, it was proposed that a combined ARVN, USAF, and U.S. Army Advisory effort be directed to support the ARVN interdiction program. This interdiction operation was to be supported by systematic FAC VR, tactical reconnaissance aircraft, and strike aircraft allocated to the interdiction program. Selected areas would be identified for intensified infrared, camouflage, color, and regular photographic search. By collaborating with ARVN's G-2, through the USAF ALO at the ARVN divisions, it would be possible to survey an area intensively for short periods to break down the details of enemy activity."^{22/}

Attesting to the effectiveness of this procedure was the success achieved by the U.S. Americal Division. Using low level infrared reconnaissance, they produced a detailed data base and conducted a short-term campaign that effectively removed the enemy from an area of seven square miles.

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An in-house capability existed in III Corps for night interdiction. The Rocket Watch mission was no longer valid, and release of the O-2 sorties to patrol the western and northern borders would hinder enemy movement and assist in keeping him off balance.

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CHAPTER V

VISUAL RECONNAISSANCE

To perform the SCAR tasks effectively, the FAC should have been assigned to a specific operational area on a repetitive basis to gain detailed knowledge of terrain and other features of the total environment. This was vital as the interdiction FAC spent the greater proportion of his time performing VR. It was estimated that upwards of 80 percent of the total airborne time of the interdiction FAC was devoted to target development and surveillance. On the other hand, the FAC in support of ground units utilized approximately only 60 percent of his flying time accomplishing VR.^{1/}

Perhaps the most significant task of the interdiction FAC was to conduct reconnaissance to acquire targets. This task was difficult to measure. It was also difficult to quantify hours flown versus the probability of overflying a target. In a detailed 7AF analysis, it was shown that although the probability of overflying a given target was ordinarily low, the program had merit in several areas. The following statistics list different values of the probability of overflying a target one or more times. The expression $P(x,m)$ gives the probability of making x overflights when the average number of these is m ; 0 represents zero overflights; F =minutes; A =area:

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	P (x o, m)	
	A = 225 Sq. Mi.	A = 400 Sq. Mi.
F = 30 Min.	0.078	0.044
F = 60 Min.	0.149	0.086
F = 90 Min.	0.215	0.126
F = 120 Min.	0.277	0.165

By reading across the rows it can be seen that the area to be searched has a large effect on $P(x \text{ o, } m)$. It is not too important that the probability of any VR flight overflying a fixed target be very high. For example, repeated daily flights ($F=90 - A=400$) would produce, in 14 days, an 85 percent probability of overflight. Overflight does not insure crew sighting, however, as this was composed of a number of variables that defy quantification.

A VR aircraft does not have to make a sighting to be of value. The very presence of the aircraft has an inhibiting effect on the enemy. Enemy troops in transit may hear a VR aircraft approaching, and freeze or conceal themselves and their equipment in such a way that it is virtually impossible for the VR aircraft to see them. Even so, it was up to the enemy to decide when it was safe to resume his activity. At any rate, his activity was disrupted and vital timing may have been impaired. It was a matter of record that the enemy had abandoned ambush sites that were discovered, or even suspected of being discovered, by VR aircraft. More tangible, but equally important, the VR program advertised to friend and foe alike that allied airpower was in the vicinity. However, if this airborne observation resulted in little or no

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strike response, its value was quickly lost.^{3/}

Some understanding of the uses of VR in-country could be gained by studying the recommendations for further action shown on VR debriefing forms. Figure 5 shows VR pilot (USAF and U.S. Army) recommendations for additional reconnaissance or for direct military action, and shows how often the pilot controlled or assisted immediate military action. A considerable fraction, 24 percent of all reported sightings, was of lucrative targets, and at least 20 percent of these targets were of such a nature that immediate military action was taken against them.^{4/}

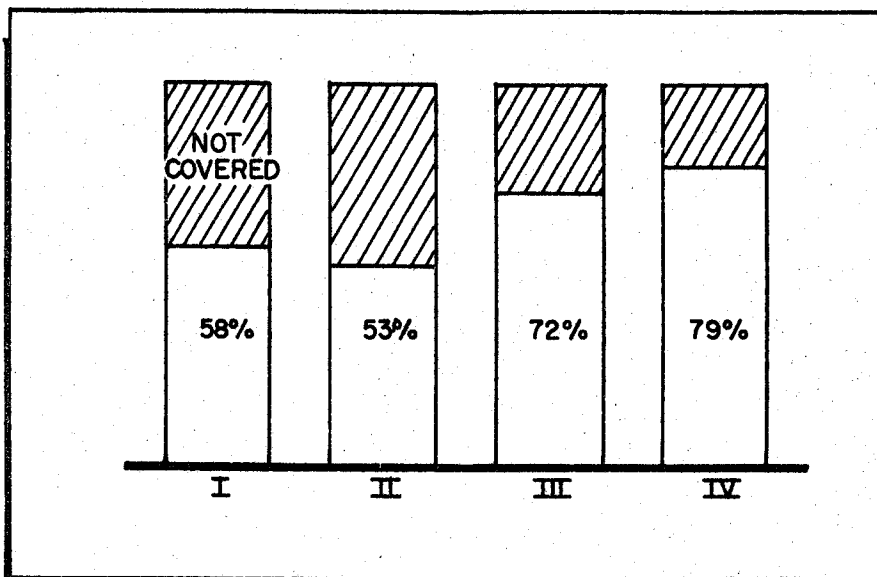
In addition to generating immediate action targets, the VR program was a prime source of the preplanned air targeting effort. In February 1966, the U.S. Army III Corps G-2 officer stated: "Sixty percent of my air targets come from the VR program." All Corps intelligence officers indicated that VR was their most important and most responsive intelligence collection effort.^{5/}

The future requirements for VR aircraft in SEA depended on the strategy and tactics of the enemy and Allied forces. It appeared that the most difficult contingency, particularly for the VR function, would arise from the enemy reducing the number of large unit actions in-country, and returning to the smaller guerrilla actions which characterized the earlier phases of insurgency. If a return to smaller guerrilla action occurred, VR could become more important as a source of intelligence, for as the targets were smaller (units of men), and were able to disappear into the environment more rapidly, it was always more difficult to provide timely air response.^{6/}

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VR PILOT RECOMMENDATIONS



AVERAGE DAILY VR COVERAGE BY CORPS TACTICAL ZONE (JAN 66)

	<u>FACILITIES</u>	<u>ACTIVITIES</u>	<u>EQUIPMENT</u>	<u>ALL</u>
TOTAL SIGHTINGS	285	105	44	434
RECOMMENDED:				
ADDITIONAL VR	173	69	40	282
PHOTO, INFRARED	29		1	30
GROUND ACTION	1	1	-	2
ARTILLERY	-	7	-	7
NAVAL GUNFIRE	-	2	-	2
AIRSTRIKES	53	33	6	92
CONTROLLED/ASSISTED:				
GROUND ACTION			1	1
ARTILLERY	3	8	1	12
NAVAL GUNFIRE		2		2
AIRSTRIKES	2	14	1	17

VR PILOT ACTIONS, DASC REPORTED SIGNIFICANT VR SIGHTINGS TWO-WEEK PERIOD

FIGURE 5

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One school of thought gave credence to the possibility that North Vietnam might be forced to de-escalate out of sheer exhaustion. Captured documents, designed for key Hanoi military and political officials, outlined major changes in the South Vietnam war in the years ahead because the conventional military invasion of South Vietnam was a failure, and necessitated a return to full-scale underground subversion and guerrilla war, as urged by Peking.^{7/}

The dispersal of enemy concentration raised the old question of the Light Armed Reconnaissance Aircraft (LARA), a complex problem which had been polemically popular since World War II. Briefly the arguments were:^{8/}

Pro-Armament

- Small, fleeting targets were often spotted by FACs, yet strike aircraft often could not arrive in time to attack, or the target was not worth a large ordnance expenditure.
- Enemy forces, from experience, knew they had a certain amount of time to take cover or disperse after they suspected being spotted. There was no immediate danger.
- Pin by fire tactics could be employed by the LARA to keep an enemy unit from moving before strike aircraft or artillery responded.

Anti-Armament

- An incentive would be provided to circumvent the Rules of Engagement. For example, the pilots might tend to become "fighter pilots" and hunt for targets they could attack alone. U.S. Army armed helicopters, when not operating in support of heliborne operations, exhibited this tendency.
- With armament, the pilots would probably take more chances and become more vulnerable.

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VR--Army Observations

An evaluation of reported experiences indicated that repeated observation of an area by the same pilot was the most productive concept for intelligence gathering through aerial observation. For example, an observer on a VR mission over thick jungle terrain observed a rope hanging from a tree. The rope had not been present during previous VR. Further observation revealed a well-camouflaged trail leading to a storage area. The sighting was reported, and the subsequent action resulted in the discovery of an enemy regimental headquarters.^{9/}

Some units preferred aircraft to be committed in pairs. By employing a team of two fixed-wing aircraft to locate enemy troops and emplacements, a reconnaissance company reported considerable success. Enemy emplacements within an area of operation were normally well-concealed and thus difficult to detect from altitudes of 1,500 feet and above.^{10/}

Regardless of the type or number of aircraft employed, an analysis of operational reports from units in South Vietnam indicated that an observation aircraft could not fly an obvious pattern with the ground track of each pass paralleling that of the last. Although such a pattern provided efficient coverage of an area, it permitted the enemy to lie in wait. The safest method was to appear erratic by changing heading and altitude constantly, while maintaining sufficient airspeed to allow evasive action in case of ground fire.^{11/}

The 223d Combat Support Aviation Battalion reported that some U.S. Army pilots were being cross-trained as Target Identification Pilots (TIP) by designated USAF FACs. The purpose of this training was to obtain more efficient use of VR aircraft by enabling observation pilots to acquire tactical air in

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the event a FAC was not available. However, the Army TIP had less control over the strike aircraft than the USAF FAC. This cross-training was discontinued by direction of 7AF in the fall of 1968.^{12/}

The training of the TIP with the USAF FAC consisted of several orientation flights with the FAC. At first, the trainee was a back seat observer, monitoring the FAC as he brought in a strike. As procedures became familiar, the TIP trainee moved to the front seat and was permitted to conduct a strike. According to the Army report: "Upon successful completion of the training, the Target Identification Pilot will have the same capability (emphasis supplied) as the FAC: to bring ordnance on a target."^{13/}

There were, however, several important differences, the most pertinent being that the TIP only performed in an advisory role, that is, to mark the target and turn the strike over to the fighter flight leader, who was then responsible for full control of the flight. Certain conditions were required before the TIP could be utilized: first, a requirement for an immediate air-strike, and second, no FAC available to handle the mission.^{14/}

In-Country VR

As mentioned earlier, the FACs in support of the ARVN were considered similar to the FACs in support of the U.S. Army. One facet peculiar to the ARVN FAC only, was the accomplishment of the VR program as outlined in MACV Directive 381-1, and 7AF Regulation 200-6. These documents established the Province Sector as a basic VR area. Approximately 259 Army O-1 aircraft participated in this VR program, in addition to the USAF effort. The Army O-1 aircraft were allocated to the senior Army advisor in each Corps, and he

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further deployed them to the divisions and sectors within his respective Corps area. In III Corps, the Army O-1s were allocated on a basis of five aircraft per U.S. Division and three aircraft per ARVN division to support the VR program.^{15/}

The Army classified its O-1 missions as VR, whether they were artillery calibration, artillery adjustment, or actual VR in the classical sense. Army O-1s were used predominately for artillery calibration and adjustment, while the USAF aircraft principally performed systematic aerial search to obtain timely intelligence. A sampling of the effectiveness of the USAF FAC VR effort was made in III Corps for the month of September 1968. The data revealed that of a total of 1,164 airstrikes in support of III Corps ARVN forces, 44 percent were generated as a result of FAC VR.^{16/}

South Vietnam was divided into 225 VR areas, the size of which was determined by terrain, vegetation cover, sector boundaries, and the areas which one aircraft and crew could cover in a systematic search during a two-hour mission. Whenever possible, the coastlines were covered twice daily, and other critical terrain, such as areas of known VC activity, Special Forces Camps, and national boundaries, were covered once a day. In addition, quiescent areas were covered once every three days to record any change in activities. Analysis revealed that to cover the borders and coastlines in South Vietnam required 3,428 flying hours per month, and as approximately 37 percent of the land mass was considered critical, a total of 7,830 flying hours were necessary to fulfill the VR task.^{17/}

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Night VR

The psychological impact of the daytime presence of FAC aircraft over an area occupied by hostile ground elements was well understood, but the deterrent effect at night upon VC and NVA transportation elements and attacking troops became increasingly evident. Night transportation was slowed, and intelligence indicated that enemy attack plans on outposts and Special Forces Camps included alternate plans if allied air arrived.

An example of night deterrence occurred in the Song Be area in South Vietnam. A VC unit continually rebuilt a bridge across a river at night, while a FAC, with strike aircraft, kept it out of commission during the daytime. One night the FAC made visual reconnaissance of the area and noticed the bridge being reconstructed; he requested and directed an immediate air-strike. The bridge was destroyed, and many of the construction workers were killed, thus ending the VC attempt to rebuild the bridge.^{18/}

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CHAPTER VI

AIRCRAFT/MANNING/EQUIPMENT

Aircraft

Forward Air Controller operations in Southeast Asia since 1965 expanded in quantity and in scope to the point that FACs were functioning over most of that territory in a variety of aircraft. The extensive use of FACs in the interdiction role generated increasing requirements for personnel and equipment. The diversity of the entire range of FAC missions precluded the development of an all purpose FAC aircraft. Rather, the need existed in four special categories:^{1/}

- High performance, high speed aircraft for use in a nonpermissive environment.
- Medium speed aircraft in a semi-permissive environment.
- Low speed, low noise level aircraft to provide low altitude, covert, night target acquisition in a semi-permissive environment.
- Rugged, low speed aircraft with a high lift coefficient to operate at forward bases in a permissive environment.

The O-1, long recognized as an inadequate FAC aircraft because of age, performance, and communication problems was gradually being phased out as numbers of in-theatre O-2s and OV-10s increased. The O-1 did possess one vital capability in greater measure than either the O-2 or OV-10; it was capable of being deployed and maintained at short, unfinished fields with primitive facilities. The O-2 on the other hand, in addition to its requirement for an improved airstrip, demonstrated poor single engine capability. The more

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effective rear engine was marginal under single engine conditions and it was virtually impossible, particularly with a two-man crew, to maintain altitude with only the front engine. The OV-10 was expensive and could not operate from short, unimproved landing strips.^{2/}

The deficiencies in the FAC aircraft inventory pointed to the need for procurement of aircraft specifically designed to meet FAC requirements. In establishing parameters for an airframe, the Commander, 7AF, cautioned that the force level or aircraft selected should not be confused with the ad hoc interdiction mission being performed out-country, as this was not a primary requirement for a FAC aircraft. Again, he undoubtedly was expressing his desire that the main thrust of the USAF FAC effort be directed toward adequately supporting the U.S. Army.^{3/}

The aircraft required to best perform the SCAR function was identified by a Tactical Air Command study as follows:^{4/}

- Performance capability to operate from relatively unsophisticated airfields with an austere maintenance environment.
- Sufficient loiter time to remain in the reconnaissance area for an optimum period.
- Required air/ground communications to coordinate activities with ground and air elements.
- Required electro-optical and other special devices to acquire targets during day, night and adverse weather.
- A defensive fire capability to include hard points for target marking and ordnance ranging from 2.75 white phosphorous marking rockets to intermediate size white phosphorous bombs.

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Quantifying aircraft requirements for performance of the SCAR function was directly related to aircraft performance and desired area of coverage and frequency of coverage. The assumption was made that the aircraft would be similar to that used by the FAC who supported ground units.^{5/}

In determining area coverage, the conduct of the search was set at 1,000-1,500 feet, 120 knots, and a four-hour sortie time, three of which were effective. VR criterion was set at a two-mile swath. Using an arbitrary area defined by a standard Army division front of 46 miles (for the war in SEA, 46 miles was extremely arbitrary; however, it did provide some form of yardstick), factors for aircraft area search were put into a standard search formula:^{6/}

$$T = X \frac{(d + t_t)}{V} + \frac{2t_t}{2} + \frac{(X - 2) w}{V}$$

T = Sortie length in minutes ----- 180

D = Search by length ----- 46 nm

V = A/C speed (nm per min) ----- 2

t_t = Time to turn ----- 1

X = Number of search legs ----- (7) derived

w = Total width of search swath ----- 2

This formula produced an optimum surveillance area of 644 square miles. Continuous coverage of this area would require:^{7/}

8 - 4 hour sorties/30 days--960 A/C hours

8 - 3 hour effective sorties

100-hour utilization = 9.6 A/C

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requirements was conducted in February 1968. ^{24/}

The requirement for FACs was conveniently divided into three operational areas: those for the in-country war, those for the out-country war, and those for staff and training. Jet FAC requirements were not included in the study. ^{25/}
FACs required to support the SCAR function were grouped as follows:

BASE DEFENSE -----	36
ARVN FACs and ALOs -----	226
5th SPECIAL FORCES -----	7
MACSOG -----	30
TIGER HOUND -----	63
STEEL TIGER -----	63

No attempt was made to divorce FACs required for the pure interdiction role with the exception of STEEL TIGER/TIGER HOUND.

The study was presented to PACAF and after minor changes were made, it was approved by CINCPACAF, TAC, and USAF. In May 1968, the formal manpower requirements letter was forwarded to PACAF for approval and necessary manpower actions. Actions were completed to provide for a total FAC force of 875 (including navigators and FACs in support of US/Free World Forces), and by ^{26/}October 1968, the system was manned with 716 personnel.

Reflecting a continuing concern for the proper FAC manning, PACAF dispatched an eight-man survey team in early November 1968. The results of their survey established the manning requirement of 805. However, there was only an actual reduction of 27 spaces as the difference resulted from the team's

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recommendation to leave in the Unit Detail Listing (UDL), but not man, 30 FAC spaces in support of the U.S. Army, plus the correction of a previous UDL, by reconverting 13 FAC spaces to Reconnaissance Officer authorizations. ^{27/}

On 11 December, 7AF reviewed the PACAF proposal in detail. The difference in the figures was a result of interpretation of the 1965 Joint Army/Air Force agreement. Seventh Air Force interpreted the agreement to require:

1 ALO, 1 FAC at Brigade level (21 Bdes)	= 42 spaces
2 ALOs per Division (7 Divs)	= <u>14</u> spaces
Total	56

PACAF interpreted that agreement to require:

2 ALOs, 1 FAC per Division (7 Divs)	= 21 spaces
1 ALO per Brigade (21 Bdes)	= <u>21</u> spaces
Total	42

Seventh Air Force, however, believed the PACAF interpretation was as valid as the one made in February 1968, and the impact on the mission resulting from the divergence was not considered significant. ^{28/}

Perusal of the report terminology suggested that the PACAF survey team considered FACs as those who were directly in support of friendly forces in-country, including base defense. The term SCAR was attached to a person and used for out-country operations only.

Equipment

With few exceptions, the whole strike process was dependent upon the FAC,

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yet the equipment provided him had been technologically neglected when compared to other air functions in SEA. The systems for target marking, target designation, and strike direction were imprecise, time consuming, and subject to error. The following discusses technological aids to the FAC.

Starlight Scope

The introduction in February 1967 of the Starlight Scope produced dramatic improvement in the night VR program in Laos. This technical aid, which was a hand held, monocular, light intensifying device, permitted visual acquisition on moonlit nights or when trucks used low headlights. After spotting the target and calling the airborne command center, the target area was flared and often the FAC used aircraft lights to mark the target. Initially, the effectiveness of this method was hindered by the short supply of scopes; consequently, it was not until the 1967-68 dry season, when they became more plentiful, that results increased. The increase can be best illustrated by comparing night data for 30 November - 2 December 1966 with data for the same period in 1967:^{29/}

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

Night VR activities by an O-2 in northern TIGER HOUND were described by the Operations Officer of the 20th Tactical Air Support Squadron as follows:^{30/}

"Because of the mountainous terrain and the lack of TACAN equipment, visual reconnaissance altitudes

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along Route 110 (in the southern area of TIGER HOUND) are 6,500 feet MSL; along Route 96 (in the north) altitude for VR is 7,500 feet MSL. When the FACs are able to fix their position over a particularly lucrative choke point, virtually all visual reconnaissance and strikes are conducted between 3,000 and 5,000 feet AGL because of the many active ZPU (heavy machinegun) and 37-mm anti-aircraft guns usually present near these targets. At night with one pilot flying and the other using the Starlight Scope, VR is conducted by using dead reckoning navigation to a known starting point and circling until the man with the scope picks up the road. Visual recce is then conducted by flying along the left side of the road and circling when promising areas are spotted."

FACs could then control attacks in darkness by orally guiding strike aircraft, while viewing the target through the scope. Sometimes they flew over the target and turned on their navigation lights to indicate the desired impact point. Either C-130 or other flareships could be used to light up the target area, while a FAC marked it for strike aircraft.^{31/}

In June 1968, the scope was introduced on a trial basis with the F-100F FACs. It was tested at altitudes between 1,000 to 8,000 feet with airspeeds varying between 250 to 450 kts. The scope proved satisfactory under certain light conditions and was recommended for incorporation into night operations. Under reflected moonlight, the scope was excellent; however, during dark night conditions, with no moon and the target unlighted, the scope did not aid night vision. It was particularly useful at dawn and dusk when it became too dark to see with the naked eye.^{32/}

Hand Held Camera

The FACs assigned to the Laotian area of operations had a requirement to

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obtain battle damage assessment, pre-strike, and lines of communication photos. The KE-28/B camera had been field tested by the FACs, and was considered to be too heavy and bulky for single pilot operations. It was almost impossible, and a hazard to flying safety, for the pilot to fly the airplane and operate the KE-28/B. As of January 1967, there were 13 Nikon 35-mm cameras in SEA for FAC use. Further, the material depot at Hill AFB recommended the Nikon F as the standard 35-mm camera for the Air Force. ^{33/} Camera distribution was programmed for a total of 65.

Other camera systems were tested. The following appeared in the 504th Tactical Air Support Group history: ^{34/}

"Intelligence information received a large boost during September with the evaluation of a hand held polaroid camera by the Tactical Air Support Squadron (20th). This test allowed rapid target information to be acquired by the sites, and useful information was obtained which is usually delayed when formal reconnaissance channels are used. It was particularly useful in obtaining pre-strike information for use with special missions for landing zone selection. However, the cameras were withdrawn at the completion of the test, and intelligence information is back to the less than adequate state from which it started."

A plausible explanation of the withdrawal was the requirement to store polaroid film at 55°F or below. In SEA, it was not always possible to procure refrigeration.

The Asahi Pentax camera was finally settled on and distributed throughout the FAC system. FACs were instructed in its use during their in-country theater indoctrination course. An experienced FAC, who had utilized the camera

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in the field, described and demonstrated the use of the Asahi. Several cameras were available at the school, and each pilot was taught the techniques, maintenance, and general care of that piece of equipment.^{35/}

Laser

The Laser Target Designator (LTD) was a promising improvement in day and night marking. These devices had been tested in the United States by FACs to covertly illuminate targets for A-1 aircraft equipped with a special sensing device. The LTD would provide a pinpoint covert marking device operable day or night without regard to surface conditions, wind, FAC aircraft payload, or terrain.^{36/}

One particular system under development was an airborne day and night viewing system with a Laser target marking function. The two-axis stabilized scanner was capable of 360° azimuth tracking and elevation tracking from straight down to 15° above the horizon. The viewing system included a 9-inch F/1.5 lens especially corrected for S-20 image tube requirements and an 80-40 zoom intensifier tube, plus an image-tuning viewer for cancellation of image rotation due to scanning motion. The viewer was designed for binocular viewing with 10-inch eye relief. The field of view was 20° in the search mode with 1=1 magnification. The Laser was boresighted through the objective lens and the field of illumination was indicated by a marked reticle. Daylight viewing with improved resolution was provided by removing the intensifier tube and installing an optical relay telescope. This change could be made in flight. The system weighed approximately 100 pounds and required 750 watts of 28V DC power.^{37/}

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Eye Glass and Airborne Personnel Detector

On 22 April 1968, the 504th TASG terminated the test of the "Eye Glass" night observation device in O-2 aircraft pending further consideration of the O-2 performance problem. This modified Starlight Scope (superscope) was heavy, weighing 137 pounds, which further impaired O-2 single engine capability. An example occurred when an O-2 lost its rear engine and the pilot was forced to jettison the \$70,000 scope. The two pilots weighed approximately 200 pounds each, and even with all ordnance salvoed, the aircraft would not stay in the air.^{38/}

The Airborne Personnel Detector (APD) was an externally mounted "people sniffer" that detected human effluents by catalytic chemical processing of sampled air constituents. The early model was tested in May 1967. The unit was found functionally unsuitable, but the primary cause for its nonacceptance was the requisite to fly at 200 feet or less above the ground to sample and detect effluents. There were no areas, particularly in Laos where it was first tested, that would permit flying at that altitude. The operating criterion was incompatible with fixed-wing aircraft, and 7AF recommended that any further consideration of the APD be limited to helicopters.^{39/}

Night Avionics System (NAS)

This system was envisioned to increase the effectiveness of the FAC in locating and directing airstrikes against targets at night. In addition, the equipment would provide a capability for delivering conventional target marking munitions. The NAS would also be capable of accepting a Laser target designator boresighted to the sensor as this equipment became available.^{40/}

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Two types of viewing devices were anticipated: low light level television or a low light level optics system, but in either case it would be capable of operating under ambient light conditions ranging from no moon with a thin overcast to near daylight conditions resulting from ground fire or illumination flares. Visibilities were to be in the vicinity of three to five miles with haze and smoke as obscurities. Information readouts provided by the system included azimuth (360 degrees) and elevation (105 degrees) and provided two fields of view: a wide field for search and a narrow field with a zoom and lock-on capability for point target observation and continuous coverage during strike control missions. The search and point target presentations were to be available to both crewmembers, and to minimize fatigue and disorientation, were to be designed for viewing with both eyes.^{41/}

Seventh Air Force basically agreed with the concept, however, some critical aspects were included:^{42/}

The concept should include the fact that the FAC will usually not have a strike aircraft at his immediate disposal during interdiction search missions. Therefore, to avoid alerting the enemy that a strike is imminent, the FAC will normally leave the target area until the strike aircraft are near the target. At this point, he must reacquire the target for strike.

The NAS must be compatible with speeds of 100-200 kts.

Summary

The requirement for FAC aircraft continually expanded, particularly in support of the in-country and out-country interdiction effort. The original workhorse, the O-1, was recognized as inadequate due to its low performance

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and survivability. The off-the-shelf O-2 certainly filled the gap; however, it was limited by poor single engine performance and survivability in high threat areas. The limited number of OV-10s introduced in mid-1968 were a vast improvement, but were expensive and could not operate from short unimproved strips. In attempting to satisfy the need for a new FAC aircraft, an All Commands FAC conference considered a rotary wing aircraft. The U.S. Army/Air Force agreement precluded this course of action and, at the time of this report, the problem was unresolved.

FAC manning vacillated from critical to acceptable. Originally, all FACs were required to have a fighter pilot background. This soon proved impractical even with an expanded combat training program. In fact, there was some question as to whether fighter experience was a valid criterion. The introduction of navigators and non-fighter qualified pilots in all FAC functions except the support of U.S. Army/Free World Forces greatly eased the manpower pinch.

Technological developments for aiding the FAC in acquiring and marking targets lagged when compared to other facets of airpower in SEA. The introduction of the Starlight Scope in 1967, dramatically increased the FACs ability to acquire targets at night. Additionally, the Laser Target Designator offered great promise in providing a pinpoint covert marking device.

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GLOSSARY

AAA/AW	Antiaircraft Artillery/Automatic Weapons
AFAC	Airborne Forward Air Controller
AFSC	Air Force Systems Command
AGL	Above Ground Level
AIRA	Air Attache
APD	Airborne Personnel Detector
ARVN	Army of Republic of Vietnam
ASD	Aerospace Systems Development
Bde	Brigade
CINCPACAF	Commander in Chief, Pacific Air Forces
CINCPACFLT	Commander in Chief, Pacific Fleet
CMD	Capital Military District
COBRA	Controller, Battlefield, Reconnaissance, and Attack
COMSEVENTHFLT	Commander, Seventh Fleet
COMUSMACV	Commander, U.S. Military Assistance Command, Vietnam
Div	Division
FAC	Forward Air Controller
FAR	Forces Army Royale
FEBA	Forward Edge of the Battle Area
FFV	Field Forces, Vietnam
FSCL	Fire Support Coordination Line
FWF	Free World Forces
IR	Intelligence Report
JAGOS	Joint Air-Ground Operations System
KBA	Killed by Air
Kts	Knots
LARA	Light Armed Reconnaissance Aircraft
LOC	Line of Communication
LTD	Laser Target Designator
MPH	Miles Per Hour
MSL	Mean Sea Level
NAS	Night Avionics System
NKP	Nakhon Phanom
NVN	North Vietnamese
OPORD	Operations Order

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PACAF	Pacific Air Forces
RLAF	Royal Laotian Air Force
RTU	Replacement Training Unit
SCAR	Strike Control and Reconnaissance
SEAOR	Southeast Asia Operating Requirement
SLAR	Side Looking Airborne Radar
SSZ	Specified Strike Zone
TAC	Tactical Air Command
TACAN	Tactical Air Navigation
TACC	Tactical Air Control Center
TACP	Tactical Air Control Party
TACS	Tactical Air Control Squadron
TASG	Tactical Air Support Group
TASS	Tactical Air Support Squadron
TFW	Tactical Fighter Wing
TIP	Target Identification Pilot
TRS	Tactical Reconnaissance Squadron
UDL	Unit Detail Listing
UHF	Ultra High Frequency
USAIRA	U.S. Air Attache
VNAF	Vietnamese Air Force
VR	Visual Reconnaissance

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