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PROJECT CHECO SOUTHEAST ASIA REPORT

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

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PROJECT CHECO REPORT

Contemporary Historical Evaluation of Combat Operations

USAF RECONNAISSANCE IN SOUTHEAST ASIA (1961-66)

25 OCTOBER 1966

HQ PACAF

Directorate, Tactical Evaluation
CHECO Division

Prepared by: Captain Mark E. Smith

S.E. Asia Team

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FOR THE COMMANDER IN CHIEF

Warren H. Peterson

WARREN H. PETERSON, Lt Col, USAF
Dep Chief, CHECO Division
Directorate, Tactical Evaluation

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12AF	1 Cy (56)	ATC (ATXDC)	1 Cy (66)
19AF	1 Cy (57)	SAC (DCS/I)	1 Cy (67)
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USAFTAWC(OA)	1 Cy (59)	SAC (DPL)	1 Cy (69)
USAFTARC	1 Cy (60)	USAFE (OPL)	5 Cys (70-74)
USAFTALC	1 Cy (61)	USAFSO (NDI)	1 Cy (75)
USAFTFWC (CA)	1 Cy (62)	USAFSO (BIOH)	1 Cy 76)
MAC (MAXDC)	1 Cy (63)		

HQ PACAF

C	1 Cy (77)	IGI	1 Cy (84)
DOP	1 Cy (78)	DOIH	1 Cy (85)
DP	1 Cy (79)	5AF (DOP)	1 Cy (86)
DI	1 Cy (80)	13AF (DPL)	1 Cy (87)
DO	1 Cy (81)	7AF (CHECO)	7 Cys(88-94)
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Foreword

Reconnaissance can be defined as the act of observing the enemy for the purpose of obtaining information about him and his activities. In the past, it has been called "the eyes of the commander," but it has become more than that. Reconnaissance now includes not only visual, but also photographic, infra-red, electronic, and communications intelligence, to name the major areas.

Perhaps the most fascinating aspect of reconnaissance in Southeast Asia is the flexibility and imagination shown by Americans, civilian and military, in developing new means of gaining intelligence. Some of these methods involved new equipment, but most were an adaption of existing equipment to new environments. Thus, the Air Force has developed and is continuing to develop, in Southeast Asia, tactics for reconnaissance in counterinsurgency operations in an hostile environment of surface-to-air missiles.

The prominence of imagination does not mean that more classic military virtues were ignored. In terms of professionalism, the reconnaissance pilots particularly, and support personnel in general, were probably the best educated and trained the United States has ever sent to war. In dedication, hard work and courage, they have continued the highest traditions of the U.S. Air Force.

Before the advent of the airplane, reconnaissance was accomplished by patrolling - the recon platoon or company, the cavalry troop or squadron. The advantages of mobility, speed, and the elevated viewing platform provided by aircraft, have been so great that, today, reconnaissance is almost synonomous with aerial reconnaissance. This study will deal only with aerial reconnaissance and, in the interest of brevity, only with U.S. Air Force reconnaissance. This is not to indicate that the U.S. Navy, the U.S. Army, the Vietnamese Air Force (VNAF), and the Royal Thai Air Force (RTAF) have not played a major role. It merely means this paper is limited to presenting a history of "USAF Reconnaissance in Southeast Asia."

To some extent, even within the USAF, the requirement for security has limited this report. This is especially true of some of the more highly classified projects and of the Visual Reconnaissance (VR) program. These will be only mentioned briefly; the former because of sensitivity and the latter because of complexity.

CHAPTER I

EARLY HISTORY

SC-47

Reconnaissance forces are among the first to be engaged in most conflicts and Southeast Asia was no exception. U.S. Air Force recce began their chapter in January of 1961 with an SC-47 which was withdrawn from operations along the Korean Demilitarized Zone (DMZ). This aircraft was deployed to Vientiane, Laos, to support U.S. Air Attache (AIRA) aerial reconnaissance efforts over Laos. It has a K-38 camera (24" or 36" focal length) and a 100" long-range oblique camera. After 38 highly successful sorties, the SC-47 was shot down over the Plaine des Jarres in central Laos on 24 March 1961. 1/

FIELD GOAL

After the loss of the SC-47, an RT-33, received from the Philippine Air Force, was sent to Udorn Air Base, Thailand. This operation, directed by 13AF OPLAN 203-61, dated 16 April 1961,(nicknamed FIELD GOAL) provided reconnaissance of Laos and Thailand for the U.S. Country Team in Laos from April to November of 1961. Toward the end of the period, a second RT-33 was received and moved to Don Muang Air Base, Bangkok. A combined team was recruited from the 15th and the 45th TRS's and consisted of Captain Whitten and Lieutenant's Linihan, Muesegaes, and Weatherby.

PIPE STEM

During the Autumn of 1961, increased Communist activity in South Vietnam indicated a need for additional reconnaissance. An "air show" came to Tan Son Nhut Air Base, Saigon, South Vietnam, and included four RF-101's (Voodoo's). When the "air show" left, the Voodoo's remained to provide the first in-country based jet reconnaissance. A cover story indicated they were "providing the Vietnamese Government with photographic reconnaissance of flooded areas in South Vietnam." A Reconnaissance Task Force (RTF) (nicknamed PIPE STEM) consisting of four RF-101's and a Photo Processing Cell (PPC) was deployed to Tan Son Nhut from the 15th Tactical Reconnaissance Squadron (TRS), Kadena Air Force Base, Okinawa. Initial personnel arrived 18 October 1961 and first sorties were flown 21 October. The Vietnamese Air Force (VNAF) provided office and maintenance space, some supplies, and an average of five or six photo interpreters each day. On 23 October, PIPE STEM crews obtained photography of the paradrop on Tchepone Airfield in Laos. Reportedly, this photography was sent to the President.

The RTF was originally scheduled for only eight days of operations; however, it was extended to fulfill additional requirements. Sixty-seven sorties over both South Vietnam and Laos obtained mosaic coverage of suspected Viet Cong areas and border infiltration routes. The first RTF returned to Kadena on 21 November 1961. 2/

ABLE MABLE

Meanwhile, the increased tempo of Communist activities in Laos led to the deployment of an additional RTF, with the nickname ABLE MABLE, to Don Muang in November 1961. 13th Air Force Frag Order 202-61, 3 November 1961, directed 5th Air Force to provide the task force from the 45th TRS. On 5 November 1961, four RF-101's departed Misawa Air Base were in place at Don Muang the next day and flew their first missions on 7 November. Manning consisted of six pilots for the four aircraft. Forty-five additional officers and airmen provided maintenance and operated a Photo Processing Cell (PPC). The PPC consisted of a Photo Lab with EH-6A and B-5A processing sections and a printing section; a Target Intelligence Section for briefing, debriefing, and reports; and a Photo Interpretation (PI) Section. In December, two U.S. Army Photo Interpreters joined the PI section to aid in the identification of ground equipment. 3/

The RT-33's assigned to FIELD GOAL were redesignated as MAIL POUCH and used as couriers for transporting film products. Upon occasion, the RF-101's would turn around at Tan Son Nhut, thus providing more time over Vietnamese targets; by using the PPC located there, a faster delivery of photography to the requestor was achieved.

At the time ABLE MABLE was being established, the Air Force realized it needed an Air Force component commander and staff to supervise various units entering Southeast Asia. For political reasons, the presence of a new command, especially a combat one, was

played down. Consequently, the new supervising air activity established 15 November 1961 was called 2d Advanced Echelon (2d ADVON).[4] It was not until almost a year later that USAF was able to call this tactical organization an Air Division (a name with combat connotations).[5]

Brigadier General Rollen H. Anthis assumed command of 2d ADVON at Tan Son Nhut.[6] There were numerous detachments, but the two most significant to recce were Det 8, 13th Air Force (2d ADVON) at Tan Son Nhut to which PIPE STEM was attached and Det 10, 13th Air Force (2d ADVON) at Don Muang to which ABLE MABLE was attached.[7] Det 10 was the new name for 13AF (ADVON).

ABLE MABLE, starting from scratch and working under most difficult conditions, compiled an enviable record. By the end of 1961, the project had flown 130 sorties and processed 53,652 feet of film. During 1962, 1060 sorties were flown with an average of 43,000 feet of film, 58,000 prints, and 90 Immediate Photo Intelligence Reports (IPIR's) being processed per month. Two ABLE MABLE aircraft received battle damage during 1961 and 10 during 1962.[8]

A good deal of the proof of the 1962 Russian airlift in Laos was obtained by ABLE MABLE. For example, one photograph revealed five Russian CRATES (C-47 type aircraft) at Tchepone Airfield, in the Laotian Panhandle. Two aircraft were on the ground and three in the landing pattern. In addition, infiltration routes were closely

watched, especially those from North Vietnam via the Nape and Mu Gia Passes into Laos. Many truck convoys were spotted; often near Ban Ban, Laos, where in January 1962, an especially large one was photographed. This helped provide the vital proof of the North Vietnamese support of the Laotian Communists, the Pathet Lao.

The fighting in northeast Laos and the Plaine des Jarres was covered to provide tactical intelligence. In South Vietnam, missions were flown along the roads from Saigon to ascertain the effectiveness of the RANCH HAND defoliation project. Extensive area coverage was also accomplished of the Camau peninsula. 9/

In a congratulatory message to the ABLE MABLE group, on the occasion of their 1,000th sortie in December 1962, Major General Theodore R. Milton, Commander 13th Air Force, stated: 10/

> "...The fact that over 90 percent of the air strike targets in South Vietnam have been obtained or confirmed through aerial photography indicated the large measure of USAF success in applying aerial reconnaissance techniques to the counterinsurgency problem. Additional evidence of the competence of ABLE MABLE is revealed in having now flown over one thousand sorties without the loss of a single recon pilot, although missions were repeatedly flown over the heaviest defended areas in Laos and are now being flown daily over South Vietnam...."

Initially 75 percent of the effort was over Laos but, in early 1962, Vietnam became the area of prime interest. In November 1962, the Joint Chiefs of Staff terminated the Laotian reconnaissance operations which were not resumed until May 1964, when project YANKEE TEAM began. 11/

In December 1962, ABLE MABLE was moved to Tan Son Nhut. Today, with numbered Tactical Reconnaissance Squadrons assigned to the 460th Tactical Reconnaissance Wing (under the newly reactivated 7th Air Force), RF-101's continue flying missions over Southeast Asia.

Basically, the 45TRS from Misawa and the 15TRS from Kadena were to rotate the assignment every six months. The 15TRS, which had earlier supplied aircraft and the PPC in support of PIPE STEM, replaced the 45TRS at Tan Son Nhut on 19 May 1962.[12] In turn, the 45TRS resumed the assignment on 15 November 1962.[13] In each case, the detachment was called an RTF, although on occasion they were referred to as Det 1 of their respective squadrons.

FARM GATE

RB-26 aircraft were used for many different missions in Southeast Asia. The first was with FARM GATE, a project which arrived in South Vietnam on 5 November 1961 to train Vietnamese Air Force (VNAF) personnel and to develop concepts of counterinsurgency. In the spring of 1962, eight T-28's, four SC-47's, and four RB-26's were stationed at Bien Hoa Air Base, South Vietnam. The RB-26's flew attack as well as visual and photo reconnaissance and, by 12 April, had 64 operational sorties to their credit.[14] In addition to K-17C cameras for vertical and oblique photography, there were gun cameras and K-20 cameras for hand-held photography. A small PPC with capability of about 1500 feet of film per day was established.[15]

BLACK WATCH

When Communist activity in Laos increased in May 1962, PACAF decided to adapt the RB-26's to provide a night recce capability for that country.[16] All the FARM GATE RB-26's carried cameras but needed rewiring for night photo and infra-red operations. Two were sent to Clark Air Base, Philippines, for modification. While being reconfigured in May 1962, they were replaced by two from Kadena marked with the aircraft numbers of the original FARM GATE planes.[17]

The two modified aircraft were deployed to Don Muang and placed under operational control of the ABLE MABLE commander. Here they performed BLACK WATCH missions - night recce of Laos. Between 29 May and 29 July 1962, these two RB-26's flew 50 such missions. After the Laotian cease-fire agreement was reached, the BLACK WATCH aircraft returned to the FARM GATE operation at Bien Hoa.[18]

SWEET SUE

In the summer of 1963, the two remaining unmodified RB-26's were sent to Clark Air Base for partial modification (no infra-red). To distinguish between the versions, the completely modified aircraft (with Reconofax IV infra-red) were designated as SWEET SUE aircraft (RB-26L); the partially modified as RB-26C's.[19]

HILO HATTIE

Under the direction of PACAF OPORD 222-62, a project to develop an infra-red (IR) capability was undertaken in an attempt to improve night reconnaissance. On 30 August 1962, a 5AF aircraft was deployed from Yokota to Tan Son Nhut with this capability.[20] This operation was designated HILO HATTIE.

PATRICIA LYNN

Building on the foregoing experience, on 15 April 1963, two RB-57E's, the first RB-57 types in Vietnam, were sent to Tan Son Nhut and nicknamed PATRICIA LYNN. This addition was welcome, indeed, since it provided an improved (Reconofax VI) and continuous infra-red capability in-country. In the past, this coverage was intermittent because it required out-of-country maintenance. IR was of vital importance in Southeast Asia where the enemy used the cloak of darkness to conceal his operations. In addition, the RB-57E would add to the day-photo capability by providing a higher-altitude, longer-range recon platform with the latest panoramic camera equipment.[21]

Since the B-57 was a jet bomber type and, therefore, politically sensitive, the U.S. Ambassador was asked to concur in its introduction to the theater. Since the PATRICIA LYNN mission and the RB-57E configuration were strictly reconnaissance, the Ambassador approved.[22]

13TH RECONNAISSANCE TECHNICAL SQUADRON

To meet the increased processing, printing, and interpreting requirements generated by the new recce aircraft, the 13th Reconnaissance Technical Squadron was activated on 10 April 1963 at Tan Son Nhut.[23/] All personnel and equipment of the PIPE STEM PPC, established in October 1961, were taken over by the 13RTS. The mission of the 13RTS was to process and print photography and prepare Immediate Photo Interpretation Reports (IPIR's) on reconnaissance missions flown in Southeast Asia; to control and distribute completed mission materials; and to provide photo and interpretive aid to the Republic of Vietnam Military and the USAF in Southeast Asia. They worked closely with the LUCKY DRAGON (a U-2 recon program) processing team, which had modern processing equipment.

The 13RTS has served as the center wherein the results of reconnaissance in Southeast Asia have been put into usable form. It is the "retina" upon which recon products have focused and which sends out messages to the "brain," the headquarters. It also stores information, having a library of about 200,000 cans of film.

The PIPE STEM PPC began with five men in October 1961; there were 88 men by the time the 13RTS was activated. By April 1966, the 13RTS had grown to 347 men. At the end of June 1963, it had processed approximately 20,000 feet of film, and was producing about 45,000 prints and 18 IPIR's monthly. In April 1966, alone, it produced 3,113,783 feet of photography.

Even while producing this enormous amount of photography and reports, the 13RTS maintained high quality and quick response, as the Commanding General of the 1st Infantry Division states in his letter of appreciation to the squadron: 24/

> "This is to express appreciation to the officers and enlisted men of the 13th Reconnaissance Technical Squadron for the outstanding support provided to the 1st Infantry Division since our arrival in-country in September of 1965 and especially during Operation BIRMINGHAM. The timely information provided by your photo and Red Haze (infra-red) reports has been a very valuable contribution (sic) to the intelligence picture upon which operational plans and tactical decisions have been based."

RECCE ORGANIZATION

Whenever a conflict escalates gradually the organization can be expected to change with the situation. This has been especially true in Vietnam where political pressure made the reconnaissance organization appear as small and inoffensive as possible. Thus, initially, names were selected for organizations emphasizing the U.S. role as advisers rather than as participants. To maintain security, many of the units, as well as missions, were referred to by code or nicknames.

To understand the organization of recce, a brief review of the recce-served command structure is necessary. Confining the organization to the USAF command element, the chart on page 14 shows the three basic commands:

(1) USAF Theater Command

(2) Sub-Command at Don Muang

(3) Sub-Command at Tan Son Nhut

As previously mentioned, the USAF Theater Command began in April 1961, as 13AF (ADVON): in November 1961, it became a detachment of 2ADVON, as did the local commands; in July 1962, it dropped the detachment nomenclature and became simply 2ADVON, with one local command becoming a Tactical Group, the other an Air Base Squadron; in October 1962, it became 2d Air Division; in April 1966, it became 7AF. In the meantime, the recce command became the 33rd Tactical Group and then the 460th Tactical Reconnaissance Wing.[25/] For comparison, the chart on page 15 shows the major recce project names.[26/]

DEVELOPMENT

OF

RECONNAISSANCE COMMAND

STRUCTURE

DATE	USAF THEATER COMMAND (Tan Son Nhut)	SUB COMMAND (Don Muang)	SUB COMMAND (Tan Son Nhut
Apr 1961		13AF (ADVON)	
Nov 1961	Det 7 13AF (2ADVON)	Det 10 13AF (2ADVON)	Det 8 13AF (2ADVON)
Jul 1962	2ADVON	6010 Tac Gp (Hq - JTF 116, Jun - Dec 1962)	6220 ABS
Oct 1962	2d Air Div	6010 Tac Gp	6220 ABS
Jul 1963	2d Air Div	35 Tac Gp	Det 1 33rd Tac Gp
Jul 1965	2d Air Div	35 Tac Gp	Det 1 6250 CSG
Feb 1966	2d Air Div	35 Tac Gp	460 TRW
Apr 1966	7th Air Force	35 Tac Gp	460 TRW

MAJOR RECONNAISSANCE PROJECT LOCATIONS

DATE	DON MUANG	TSN	BIEN HOA	UDORN	DA NANG	GENERAL
Apr 1961	FIELD GOAL					
Nov 1961	ABLE MABLE		FARM GATE			
May 1962	BLACK WATCH					
Dec 1962		ABLE MABLE & BLACK WATCH				
Apr 1963		PATRICIA LYNN				
Feb 1964		HAWK EYE				
May 1964						YANKEE TEAM
Apr 1965		BIG EYE		GREEN PYTHON		BLUE TREE
Sep 1965					SILVER DAWN	
Jan 1966		DRILL PRESS				

DET 1, 33RD TACTICAL GROUP

As more and more units arrived and the number of sorties increased, a demand for central control of effort was generated. In September 1962, 13AF activated a Reconnaissance Technical Division to exercise command supervision over PPC's located at Tan Son Nhut, Don Muang, and Clark. Functions included staff supervision of plans, requirements, production, manning, logistics, and quality control.[27]

On 8 July 1963, Detachment 1, 33rd Tactical Group was organized and initially manned with six PCS officers.[28] The mission was to accomplish reconnaissance requirements for Southeast Asia. All recce forces in-theater were placed under the detachment, with command exercised by 2AD, through the Air Operations Center. The elements consolidated were: two RB-26C's, two RB-26L's (from Bien Hoa), two infra-red capable RB-57's and six ABLE MABLE RF-101's (from Tan Son Nhut).[29]

All crews and maintenance personnel were TDY, except the three RB-57 crews, which were made up of six PCS officers assigned to Det 1. These three crews were the first PCS recce assigned the theater and provided the basis for Det 1's proud claim to being the oldest recce unit in Southeast Asia. Det 1 compiled an enviable record of 6,717 sorties and 15,551 flying hours from 8 July 1963 to July 1965,[30] the period from its activation to redesignation as Det 1, 6250th Combat Support Group. The chart on page 17 shows "Det 1 Flying Data" in detail.

DET 1 FLYING DATA

AIRCRAFT	SORTIES	HOURS FLOWN
JUL -- DEC 1963		
RF-101	652	1,497
RB-57	156	439
RB-26	245	593
TOTAL	1,053	2,529
JAN -- JUN 1964		
RF-101	908	1,908
RB-57	293	670
RB-26	139	321
TOTAL	1,340	2,899
JUL -- DEC 1964		
RF-101	1,411	3,214
RB-57	320	690
TOTAL	1,731	3,904
JAN -- JUN 1965		
RF-101	1,839	4,665
RB-57	556	1,064
RB-66	198	490
TOTAL	2,593	6,219
JUL -- DEC 1965		
RB-57	691	1,565
RB-66B	522	1,255
TOTAL	1,213	2,820

Total Jul 1963 -- Dec 1965 7,930 Sorties and 18,371 hours.

PACAF RECONNAISSANCE SURVEY

PACAF's Reconnaissance Division conducted a comprehensive study of recce in Southeast Asia during the period 26 October to 9 November 1963. The survey was to "investigate inadequacies in the reconnaissance cycle, recommend remedial actions, and determine ways to improve Air Force capability to furnish air and ground commanders an improved and more timely reconnaissance product." 31/

The PACAF team concluded that, almost without exception, delivery of requested materials was accomplished on or before deadlines. Furthermore, they noted a marked improvement in photo quality. On the minus side, they reported that requestors were submitting seemingly invalid requirements. It was recommended that requestors submit more specific justification for those requirements. 32/

ANTHIS STATEMENT

Major General Rollin H. Anthis, 2d Air Division Commander until December 1963, pointed out that reconnaissance in Southeast Asia had many unique problems. World War II, Korean, and Cuban experience had to be discounted. In Cuba, for example, targets were stationary and crews could pre-plan missions against them. If weather interfered, the target would still be there the next day. In Vietnam, however, targets often were squads of men in diversified dress, located in mountain areas under three layers of jungle canopy. Specific problems were: 33/

"1. Inability to identify the enemy by geographic location, dress, working habits, or physical features which did not differ from the local friendly populace.

2. Requirement for pinpoint navigation over extensive areas void of positive check points and navigational aids for accurate positioning and locating of targets and subsequent photography.

3. Heavy haze and adverse weather conditions.

4. Requirement for visual reconnaissance and photo coverage along irregular, poorly defined borders.

5. Small, fleeting targets difficult to locate and photograph.

6. Inability to observe enemy activity below the dense forest canopy or in heavy foliage.

7. Lack of conclusively proven techniques and procedures for employing night photography and IR in a SAW environment."

General Anthis said that the traditional Tactical Reconnaissance aircraft, the RF-101's, RB-57's, and the RB-26's were not ideal for Special Air Warfare (SAW). The USAF needed aircraft using shorter, less prepared runways; having a dual recce-strike role and sensors (such as Low Light Level Television (LLLTV) or image orthicon) to penetrate darkness. He suggested developing a recon cell, consisting of a lightweight, air-transportable PPC (which could be carried by an aircraft comparable to the C-123), one or more recon aircraft, and a small maintenance team. This recon cell could be deployed to corps or division level to provide a faster response. General Anthis recommended that the Tactical Air Reconnaissance Center (TARC) be tasked to investigate these areas and to develop and test new equipment and tactics for reconnaissance in a SAW environment. 34/

SEALTEST

Late in 1963, a prisoner reported that the VC were moving supplies by sea into the Camau Peninsula in southernmost Vietnam.[35] Several night photo recon missions showed unusual shipping activity in the area and Operation SEALTEST was established, as a one-week test, to verify the existence of this shipping. The RB-26's of Det 1 flew 24 sorties, averaging three hours each, consisting of an early morning and a late afternoon flight from Vung Tau around the Camau Peninsula to the Cambodian border, each day, from 30 December to 4 January 1964. Visual recon from 5,000 feet, over an area 50 miles seaward from the coast, produced sightings of 4,038 vessels in the six-day period.[36]

The initial sightings indicated that the naval control of the area was not complete enough to interdict VC shipment of supplies. The Navy concurred and created a three-mile restricted zone which resulted in a noticeable reduction of coastal shipping. The one-week test was so successful that the visual reconnaissance (VR) operation was continued until mid-April. RB-57 flights were also conducted, periodically, to vary the coverage, patrol times, etc. A direct radio system was established so that suspicious sightings could be quickly checked with the Navy.[37]

On one of the early flights, numerous fortifications were sighted along the Kien Hoa province coast. Subsequent photography confirmed the sighting. The Vietnamese Army, Navy, and Air Force carried out one of its first combined, three-service assaults on this position.[38]

RB-26's

Flying for FARM GATE and Det 1, 33rd Tac Gp, the B-26's in Vietnam were plagued by a series of wing failures, which may have contributed to the loss of a Det 1 RB-26L in December 1963. All RB-26's were grounded by PACAF for the period 18 to 21 February 1964. 39/ Because of a shortage of air strike vehicles, the two RB-26's of Det 1 were equipped with Norden bombsights and loaned to the 1st Air Commando Squadron (FARM GATE) at Bien Hoa to determine the feasibility of using them for low-level bombing. This left Det 1 with only one RB-26 aircraft, an RB-26L. On 24 February 1964, 2AD asked 13AF to replace the RB-26's with additional RB-57's to improve night and day photo capability. 40/

On 20 March 1964, the last RB-26 was transferred and subsequently grounded by PACAF. 41/ All RB-26 crews were reassigned.

YANKEE TEAM

The Geneva Conference of 1962 established a Communist-Neutralist-Royalist troika government in Laos and ended the ABLE MABLE reconnaissance of that country. On 17 May 1964, the Communists disregarded the coalition and attacked the Neutralists on the strategic Plaine des Jarres (PDJ). The situation immediately became critical. Reconnaissance was desired, both for military intelligence purposes and to prove that the Laotian communists, the Pathet Lao, were being aided by the North Vietnamese communists, the Viet Minh, and the Chinese communists.

On 18 May 1964, the Joint Chiefs of Staff (JCS) authorized reconnaissance of Laos. The first flights were made the next day.[42] The operation, called YANKEE TEAM, initially employed Navy RF-8's and RA-3B's from the Seventh Fleet and RF-101's from Det 1, 33rd Tac Gp at Tan Son Nhut. Its purpose was to:[43]

> 1. Provide timely tactical intelligence which may be used by friendly forces in Laos in the conduct of current operations.
>
> 2. Substantiate, if possible, the extent and scope of infiltration of war material, troops, and resources from DRV via Laos in RVN.
>
> 3. Provide a psychological "shot in the arm" to the Laotian, Thai, and other friendly forces in SEA.
>
> 4. Demonstrate overtly to the Communists our interest and determination to stay in Southeast Asia. The program must be responsive to the requirements of the U.S. country team in Laos, MACV, CINCPAC, the JCS, and higher authority.

The program was coordinated by MACV, as a subordinate unified command under CINCPAC, through the Air Force Component Commander, Maj General Joseph H. Moore, who was also Cmdr of the 2AD. Initially, only strikes on AA targets which fired on the recce aircraft were to be made.[44]

On 6 June 1964, a Navy RF-8 was shot down and the pilot, Navy Lieutenant Charles Klussman, was captured. The next day, a Navy F-8, flying as escort to a recon aircraft, was also shot down. Until this time, USAF planes were shot at four times (on 26 May, and 1, 3, and 5 June) but not hit. In retaliation, eight F-100's, staging from Tan

Son Nhut, struck the Xieng Khouang anti-aircraft installations on 9 June. This action marked the first use of USAF jet firepower in Southeast Asia.

During June the flights continued, but on an irregular basis due to the changing decisions of Laotian Prime Minister Souvanna Phouma. By July they were on a regular basis and a YANKEE TEAM command post, with Navy participation, was established at 2AD.

Second Air Division OPORD 502-64 established procedures for F-100 escorts from Da Nang for all flights and for refueling, initially by KB-50J and later by KC-135 tankers, if required. The JCS laid down the following rules:[45/]

1. Recce aircraft will use medium-level (10,000 feet AGL minimum) altitudes above hostile ground fire.

2. Route recce will be at medium altitude.

3. Low level recce against strong AA positions will be made only with cogent reasons of great priority.

4. Retaliatory fire is permissible if recce or escort planes are in danger.

5. Low level recce permissible when medium level won't get results.

6. In low level flights where the recce or escort plane is fired on, retaliatory fire is permissible on the first pass or later.

7. When authorized by the JCS, advance attacks on known AA positions is authorized.

The YANKEE TEAM operation put a strain on the six ABLE MABLE RF-101's of Det 1, so an additional six RF-101's were brought to Tan Son Nhut, four in July and two in August 1964.

On 18 November 1964, the USAF lost its first jet aircraft in Southeast Asia, an F-100 flying YANKEE TEAM escort. Three days later the first USAF jet reconnaissance aircraft was lost when an RF-101 crashed about forty miles east of Thakhet. The pilot, Captain Burton L. Waltz, of the 15th TRS, on TDY to Det 1, bailed out, was picked up by Air American helicopters and flown to Korat, Thailand. 46/

The YANKEE TEAM effort decreased the enemy daytime activity in Laos, but increased his night movements. Available for night recce were the RB-57's of Det 1 at Tan Son Nhut, which were infra-red (IR) configured and capable of night photography. Project TOY TIGER in 1962 modified some of the RF-101's which improved low-level operations and gave them a night photo capability. The aircraft had been withdrawn from Southeast Asia for use in the Cuban crisis, due to the successful low-altitude capability. Three of these aircraft were returned to Southeast Asia in May. The night photo capability, however, met with reverses, primarily because the RF-101 had no self-contained navigation system and also due to poor photo quality. 47/ Thus, the USAF night capability depended on the two RB-57's of Det 1 which were capable of IR and night photography. Two more night-capable RB-57's were added to Det 1; one in December 1964 and one in January 1965.

In December, CINCPAC asked the JCS for an RTF of four RB-66B's and two RB-66C's to be deployed to Clark. These aircraft had the endurance to provide a diversified mission capability including Electronic Intelligence (ELINT), which was then being performed only by the Navy's EA-3B's.[48] RB-66's began arriving in Southeast Asia in April 1965.

By the end of 1964, 449 YANKEE TEAM reconnaissance sorties had been flown. Of these 226 were USAF and 223 were Navy. Although 490 armed escort sorties were flown, each service had lost but two aircraft. In total, including weather recon and ELINT missions, over 1,500 missions were flown during 1964.[49] By the end of 1965, YANKEE TEAM reconnaissance sorties totaled 2881; 1907 being USAF, 974 USN. By 31 May 66, USAF had flown 4,214 YANKEE TEAM reconnaissance sorties.[50]

The program produced considerable tactical intelligence and helped to confirm suspected activity obtained from high altitude coverage such as LUCKY DRAGON, the Strategic Air Command U-2 flights.[51] It verified infiltration routes and way-stations into both Laos and South Vietnam, an example of which was confirmation of the Mu Gia Pass as a key way-station on the Ho Chi Minh Trail into South Vietnam. They also provided a photo base for crossborder operations, which were then being planned, and for contingency operations. More immediately, they revealed targets for strikes by Royal Laotian Air Force (RLAF) T-28's.[52] As the 2AD history states:[53]

"The significance of the YANKEE TEAM operations lay in the precedent which they established. While their primary purpose was to help the Royal Laotian Government in their (sic) flight against the Pathet Lao, the use of RVN-based jets to fly photo recon and strike missions against targets in Laos was a highly significant precedent."

LAOTIAN STRIKES

YANKEE TEAM recon, which had begun in May 1964, revealed the extent of both the Pathet Lao activity in Laos and of the infiltration into South Vietnam. Ambassador Maxwell Taylor presented this information to Washington in late November 1964 and won approval for BARREL ROLL, a program of strikes in Laos. Broad guidance was provided in draft NSAM 319, 29 Nov 64, subsequently modified by the National Security Council (NSC) on 1 December. The strikes began on 14 Dec 64.

Recce support of BARREL ROLL was provided by YANKEE TEAM assets. Therefore, with the exception of bomb damage assessment (BDA), flown concurrently with the strike, recon missions were subject to the constraints and approval procedures of YANKEE TEAM. It followed that, especially prior to April 65, there were times when no low altitude or oblique prestrike photography was available and quick approval for new missions could not be obtained.[54]

BDA aircraft were not limited by altitude restrictions as were regular YANKEE TEAM missions. The RF-101's were used in a Pathfinder/BDA role in which a recce pilot, familiar with the target area, accompanied the strike flight and provided enroute navigational assistance to the target. After the strike, the Voodoo accomplished the BDA.[55]

BARREL ROLL was aimed at the Pathet Lao/Viet Minh (PL/VM) operations in Laos and, as such, concentrated on Northern Laos. The JCS accepted recommendations of the Army Chief of Staff for a program of strikes in Laos, separate from BARREL ROLL, to concentrate not on the PL/VM but on Viet Cong support moving through Laos for infiltration into South Vietnam. This operation conducted in Southern Laos was initiated 3 April 1965 and called STEEL TIGER. The program oriented toward armed recce against lines of communication (LOC's) in Laos leading to SVN.[56/] In December 1965, a portion of STEEL TIGER area was assigned special priority for interdiction and dubbed TIGER HOUND.[57/]

CHAPTER II

THE BUILD-UP

TONKIN GULF INCIDENTS

The Pathet Lao attacks beginning 17 May 1964 on the Plaine des Jarres had led to YANKEE TEAM operations in Laos and had escalated the conflict and reconnaissance requirements in Southeast Asia. The start of a new emphasis on airpower began with the Tonkin Gulf incidents.

At 1608H on 2 August 64, three North Vietnamese PT boats fired 37mm guns and launched three torpedoes at the destroyer USS Maddux, on DE SOTO patrol in the Tonkin Gulf. F-8 aircraft and the Maddux's guns drove off the attackers, damaging three of them.

At 2303H on 4 August, an undetermined number of PT boats attacked the destroyers USS Maddux and USS Turner Joy at 1817N/10732E. There were indications that two of the attackers were sunk.

On 5 August, retaliatory strikes were carried out against four PT boat bases and the Vinh POL storage area, destroying 25 boats.[1/]

PIERCE ARROW DEPLOYMENTS

More significant than the retaliatory strike (PIERCE ARROW) was the deployment of strength to Southeast Asia which followed. Prior to the incident, the Air Force jet units in South Vietnam were the ten RF-101's, eight F-100's at Da Nang and the two RB-57's of Det 1 at Tan Son Nhut.

In addition, there were six F-100's at Takhli, and four F-102's at Don Muang. These aircraft were primarily for YANKEE TEAM and related strikes in Laos. The PIERCE ARROW deployment after the attack more than doubled the size of the jet force, adding one F-105 and two B-57 squadrons, plus four F-100 aircraft and six F-102's. For recon, two more RF-101's went to Tan Son Nhut, raising Det 1's total to twelve.[2/]

COMUSMACV recommended that photo recon over South Vietnam be increased to insure detection of movement of Communist troops across the DMZ or into Laos. Photo recon also confirmed the need for the build-up when 7 Aug 64 photos showed thirty MIG's on Phuc Yen Airfield, North Vietnam.[3/]

NORTH VIETNAM STRIKES

As early as June 1964, plans were begun for strikes against North Vietnam. At that time, the JCS asked CINCPAC to complete target planning for 94 targets in the North. Hopefully, the destruction of these targets would destroy the will and capability of the North Vietnamese to fight. The Tonkin Gulf incidents, mentioned above, led to one retaliatory strike and to sizeable deployments to Southeast Asia. Plans and forces were kept in readiness for retaliation against either another attack on the destroyers on DE SOTO patrol or a North Vietnamese attack on the South. Retaliatory strikes were considered after the VC mortar attack on Bien Hoa, 1 November 1964, and Brink's BOQ bombing the next month (both direct attacks on Americans) but were not carried out.[4/]

However, when the Viet Cong hit the American installations at Pleiku on 6 Feb 65, the JCS directed the execution of a reprisal, in accordance with FLAMING DART (the plan for retaliatory attacks against the North).[5] Again, when an enlisted men's billet in Qui Nhon was hit on 10 February, another FLAMING DART retaliation was made. This strike was the last of the FLAMING DART program.

It was followed by ROLLING THUNDER, initially an eight-week program to apply pressure to North Vietnam by air strikes. The first strike occurred 2 March 65, and the program continues today.[6]

BLUE TREE

Although the TROJAN HORSE U-2 strategic reconnaissance provided coverage of North Vietnam, there was no tactical reconnaissance prior to FLAMING DART strikes. TROJAN HORSE photography was of small vertical scale but usable for targeting. Bomb damage assessment (BDA) for the FLAMING DART missions was flown by YANKEE TEAM assets, using RF-101's and Pathfinder BDA tactics, similar to those used in BARREL ROLL strikes in Laos.[7]

As the ROLLING THUNDER program got underway, the JCS granted CINCPAC authority to [conduct] BLUE TREE, a reconnaissance program over North Vietnam, south of the 21st parallel and outside a forty-mile radius of Hanoi and Haiphong. These missions could be conducted at low level and at a frequency not to exceed ten missions, two aircraft each (twenty sorties) per week.[8] Its purpose was to provide photo coverage to update

9 March 65 ? Blue Tree initiated on 16 February 1965

target folders and to develop future targets. The first BLUE TREE mission was flown on 27 March 65, using the existing Det 1 assets. Later, to equalize the recon load and to better identify targets, the BLUE TREE area was divided into six route packages. Initially, these were rotated between USAF and USN. Later, each was assigned permanent route packages.

One RF-101 was lost on 3 April on one of the most stubborn targets, the Thanh Hoa railroad and highway bridge. Thirty-one F-105's bombed the bridge, supported by other aircraft. The bridge was damaged but remained standing. Subsequently, we lost an F-100 and an RF-101.

For the first time in Southeast Asia, USAF was flying recon commensurate with traditional doctrine of Tactical Air. Now, there were fixed point targets (i.e. barracks, bridges, and power plants), rather than squads of men in civilian clothing, under three-canopy jungle, which had often been the targets in the South. Of course, the problem of finding LOC's (and vehicles on them) remained.

BLUE TREE flew 1061 sorties by the end of 1965; 640 being USAF, and 421 being USN. By 31 May 66, USAF had flown 2,047 BLUE TREE sorties.[9/]

CINCPAC issued an operations order on 5 Mar 65 for weather recon flights over North Vietnam called WASHING WINDOW. The order directed flights south of the 19th parallel, as required on a frequent but random basis to prevent disclosure of planned strikes. The missions

were to be conducted at least four times weekly, in flights of two, at a minimum of 10,000 feet.[10/]

ESCALATION SUMMARY

The nature of the air war in Southeast Asia changed considerably in the year following May 1964. From a primarily in-country struggle, it spread into Laos and North Vietnam. From a primarily counterinsurgency battle (flying T-28's and B-26's), it escalated into a full scale tactical air operation including close air support, direct air support, interdiction and attrition, flying F-100's, F-105's, and B-57's. The following chart gives a brief summary of the escalation:

ESCALATION

(Program Inauguration)

	Recon	Strike/Interdiction	Date Begun
Laos			
	YANKEE TEAM		May 1964
		BARREL ROLL	December 1964
		STEEL TIGER	April 1965
		TIGER HOUND	December 1965
North Vietnam			
		FLAMING DART	February 1965
		ROLLING THUNDER	March 1965
	BLUE TREE		April 1965

GREEN PYTHON

The reconnaissance of Laos and North Vietnam, under projects YANKEE TEAM and BLUE TREE, generated a need for more recon aircraft. In South Vietnam, air bases were overcrowded and vulnerable. In addition, the difficulty in reaching targets in Northern Laos and Vietnam from these bases led to considerable discussion of establishing a recon base in Thailand.[11/]

In April 1965, six RF-101's were deployed from Kadena Air Base, Okinawa, to Udorn Royal Thai Air Force Base, Thailand, to establish project GREEN PYTHON.[12/] These aircraft had initially deployed from TAC in August 1965. GREEN PYTHON mission was to provide day photographic and visual reconnaissance in Laos and North Vietnam, as directed by 2AD.[13/] Concurrently, eight additional TAC RF-101's were sent to Kadena to maintain the force level. However, the next month six more of these Voodoo's were flown to Udorn giving the GREEN PYTHON force a total of twelve. These TAC planes were a mixture of standard camera system (KA-2) and low-level 1181 configuration developed from TOY TIGER (KA-45). PACAF RF-101's were undergoing modification to the 1181 configuration (KS-72, KA-57 Panoramic) with completion scheduled for August 1965.[14/]

A glance at the map on page 33 reveals the strategic location of Udorn, an excellent site from which to cover northern Laos and North Vietnam. Considering its proximity to North Vietnam, Udorn was a key base. Thereafter, Udorn and Tan Son Nhut became the two major

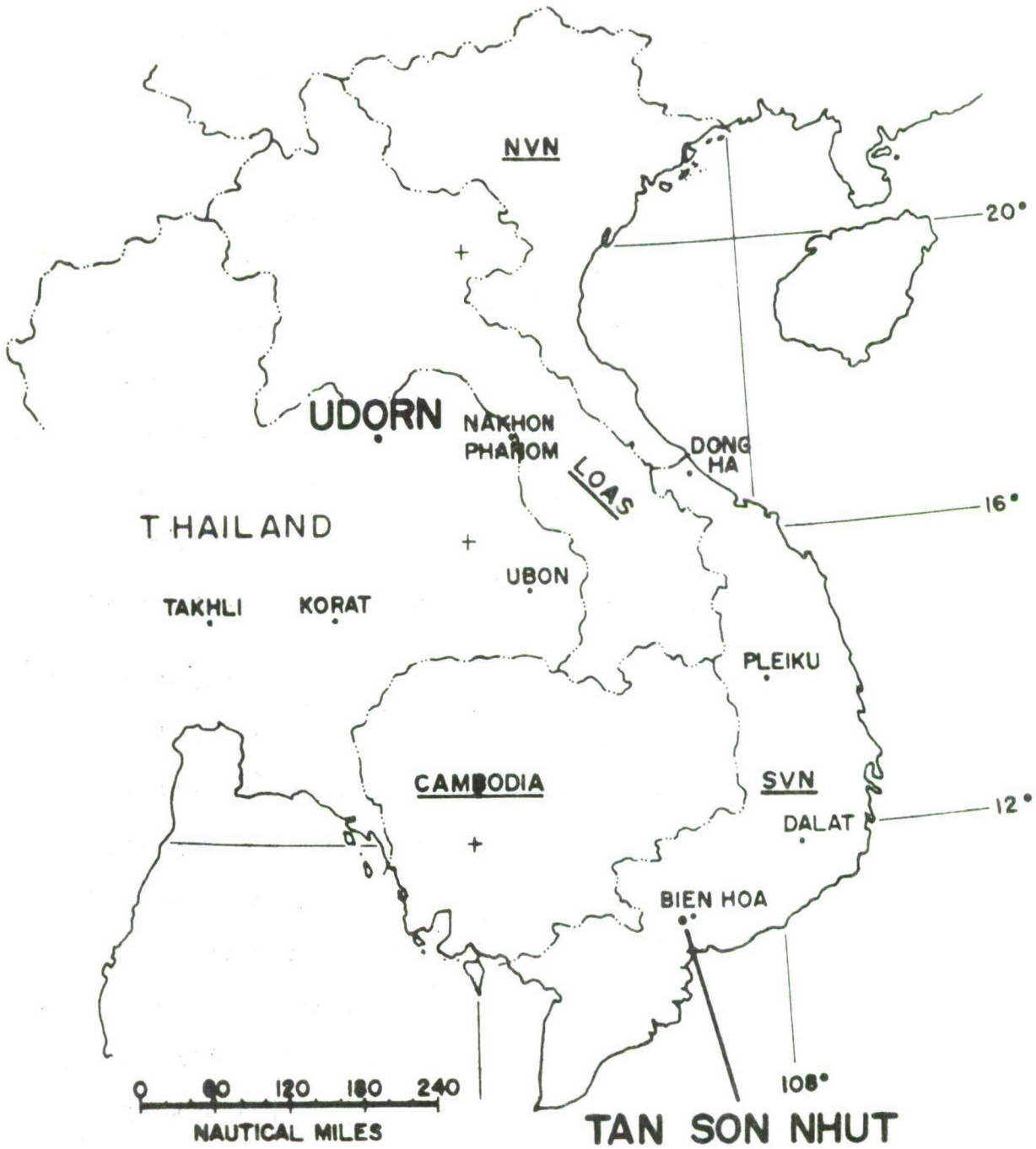
reconnaissance bases in Southeast Asia. For the day-visual and photographic recon the RF-101's took the load. There was a natural division; ABLE MABLE (Det 1 at Tan Son Nhut) took the in-country missions (some nearby out-country) and GREEN PYTHON (then the TAC aircraft at Udorn) took the out-country missions.[15/]

In November 1965, the 15th RTF from Kadena took over GREEN PYTHON responsibility. At the same time, the 20th TRS acquired the twelve RF-101's of Det 1 at Tan Son Nhut.[16/]

This led to difficulty since targets in the heartland of North Vietnam were heavily defended and the Udorn operation, consequently, suffered heavy losses. (See Appendix B for USAF Reconnaissance Losses in SEA.) Additionally, there was the problem of rotation attrition in that Udorn crews were quickly amassing 100 NVN mission credits. In April 1966, the 20th TRS moved from Tan Son Nhut to Udorn, and the 45th RTF moved to Tan Son Nhut.[17/]

In May of 1966, an additional four RF-101's were sent to augment the 20th at Udorn.[18/] In July, the 45th at Tan Son Nhut was due to receive an additional four aircraft and become a TRS instead of an RTF. This would mean that, as of December 1966, there would be 32 RF-101's in SEA (sixteen with the 45th TRS at TSN and sixteen with the 20th TRS at Udorn).

A concise presentation of the story of USAF Reconnaissance in Southeast Asia is shown in Appendix A. It illustrates both the early


NVN
20°
UDORN
NAKHON PHANOM
LOAS
DONG HA
16°
THAILAND
UBON
TAKHLI
KORAT
PLEIKU
CAMBODIA
SVN
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DALAT
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TAN SON NHUT

history and the buildup. In covering this period of multiple deployments, it was felt that a chart would clarify the movements and possibly assist in understanding the early history and the RB-66/RF-4C deployments to be discussed later.

On 11 June 1964, Det 2, 35th Tac Gp, had been established at Udorn[19/] and an RTF of six RF-101's with a PPC had been proposed. When the Voodoo's arrived the PPC was activated. In November 1965 it became Det 1, 13th RTS,[20/] with the mission to process film, make select prints and write IPIR's on photography by aircraft recovering at Udorn. By June 1966 they were processing approximately 570 missions each month. Its busiest day was 30 June 1966, the day after the first raid on the Hanoi POL storage, when 45,769 feet of film were processed.[21/]

The Hanoi POL raid of 29 June 1966 provides an excellent example of reconnaissance in North Vietnam. Sorties were directed to fly into the restricted zones around Hanoi and Haiphong and bomb major POL storage and transshipment areas. The Navy was assigned Haiphong; the Air Force, Hanoi. Because of the Presidential-level commitment to avoid unnecessary civilian casualties, the exact target location and boundaries had to be known to permit the bombers to "surgically" destroy the target without collateral damage. BLUE SPRINGS, a C-130 launched reconnaissance drone, provided the pictures for detailed target study. On the evening of 28 June, the "Frag" assigning the missions was published. Weather reconnaissance flown early on 29 June found weather conditions marginal, but improving. The waiting

F-105 strike force was delayed until the weather cleared, then launched.

Major Hallett P. Marston, also with the 20th TRS, who had flown in Korea and over Cuba during that crisis, was assigned the BDA mission following the strike. Alerted by the waves of F-105's, the flak was intense and accurate from three minutes before target until two minutes after. He made one pass by the target, obtaining nose oblique photography as he approached, then panoramic (K-56) coverage as he banked the airplane and passed the target. It was an oblique shot (frame 028 of mission UE 901F, 460 TRW) which received world-wide publicity. This photo is shown on page 36.

RB-66B/C

With the beginning, in March 1965, of strikes in North Vietnam under the ROLLING THUNDER program, U.S. air power ran into what Brigadier General George B. Simler, 7th Air Force Deputy for Operations, calls "the most sophisticated defense system the United States has ever flown against, in any war."[22/] As early as the end of June 1965, there were 3000-plus AA weapons in place and five SA-2 Surface-to-Air Missile (SAM) sites.[23/] Because the SAM's and an increasing number of the guns were radar-controlled, it was apparent that Electronic Intelligence (ELINT) and Electronic Counter-Measures (ECM) configured aircraft were required.

The photo on page 38 shows one of the 57mm AA sites located 50 miles south of Hanoi, and demonstrates the low-level photo capability.

Hanoi POL Raid, 29 June 66

A Soviet-built radar is at the lower left, below the shadow of the RF-101 which took the picture.

In April 1965, four RB-66B's and two RB-66C's from TAC's 9th TRS were deployed to Tan Son Nhut. The following month the two RB-66C's, plus four deployed from the U.S., went to Takhli Air Base, Thailand. In September, they were joined by an additional three. All nine RB-66C's (as the 41st TRS) provided ELINT/ECM support for ROLLING THUNDER.

Three of the four RB-66B's were IR equipped and helped meet the growing night reconnaissance requirement.[24] Known as Det 1, 41st TRS, they were attached to the old Det 1, 33rd Tac Gp, at Tan Son Nhut. However, they were aging aircraft and, after the RF-4C's arrived with more modern IR, were returned to the U.S. in April 1966.[25]

PHASES OF BUILDUP

In response to Viet Cong augmentation, the United States decided to increase its forces in Vietnam. During July 1965 Secretary of Defense Conference in Vietnam, a master plan for this American buildup was devised. It was scheduled in three phases:

> Phase I - Forces to halt the Viet Cong offensive and stem the tide. Usually stated as, "Stop losing", to end 31 Dec 1965.
>
> Phase II - Additional forces to resume the offensive. Usually stated as, "Start winning". To end 30 Jun 66.

57MM AA SITE IN NVN

Phase III - Additional forces to defeat the remaining Viet Cong and to pacify the country. To begin 1 Jul 66.

Due to continued increase of Viet Cong strength, the date for completion of Phase II was slipped. Phase IIA was scheduled to end 31 Dec 1966.[26/]

As of 30 June 1965, 2AD exercised operational control over 41 recon aircraft. Phase I and II plans, as approved by MACV, CINCPAC, and JCS, would have increased this to 75. As out-of-country activities increased and NVN defenses improved, it became apparent that ECM support would necessarily increase. In August 1965, 35 ECM aircraft were requested. The request was approved and later increased to 38.[27/]

When Phase IIA was planned, USAF proposed adding 48 RC-47's for the Airborne Radio Direction Finding (ARDF) program, plus other increases, to bring the Phase IIA total to 180 recon aircraft.[28/]

B-66B

Configured as ECM aircraft, the B-66B's have no ELINT capability. They are equipped to accompany the strike force and actively jam enemy radar. Using the K-5 RBS (called PATHFINDER) they have led bombers to targets. Five B-66B BROWN CRADLE aircraft were brought to Takhli from the 42d TRS at Chambley, France. These were assigned as Det 1, 25th TRW, and were under the operational control of the 41st TRS. In May 1966, the remaining eight USAFE squadrons' planes were brought to Takhli. The thirteen B-66B's formed the 6460th TRS in June 1966.[29/]

ECM aircraft now accompany all major strikes and are generally credited with keeping down the number of SAM hits on U.S. aircraft.

ELINT, as flown by the EB-66C's (re-designated) and the Navy EA-3B's and Marine EF-10B's, provide locations of the FAN SONG radar of SAM's and the FIRECAN radar of AAA, so that pilots can avoid them. The EB-66's also provide a "Missile Alert" or "Missile Launch" warning of SAM attacks. ELINT has provided the basis for approximately 90 percent of the information on the SAM Order of Battle.[30/] In July 1965, it picked up signals giving first indication that North Vietnam might have acquired an IFF capability. Later, ELINT detected the first SCAN ODD signals, indicating a possible all-weather fighter.[31/]

EW aircraft flew 1138 sorties from 7 Jan to 31 May 1966.[32/] Two EB-66's were lost, both due to SAM's.[33/] (See Appendix B, USAF Reconnaissance Losses in Southeast Asia, for details.)

Basically, this was the first time tactical EW had been used in a combat situation and with excellent results. In the future, as 15-year old equipment is replaced, EW may accomplish even more.[34/]

BIG EYE

When the attacks began in North Vietnam February 1965, it became apparent that protection was needed from enemy fighters. In addition to an F-4C MIGCAP to oppose enemy fighters, radar coverage was needed to give timely warning. The Nakhon Phanom radar site provided some coverage; however, imaginative USAF officers felt that airborne early

warning, as flown for years off the coasts of the United States could do the job better.

Consequently, in April 1965, three EC-121's were brought to Tan Son Nhut.[35/] In October, a fourth arrived. The mission, called BIG EYE, was to detect enemy aircraft on airborne radar and to call MIG warnings. In addition, they could relay MIG warnings initiated by other aircraft and track friendly aircraft for position information should those aircraft be downed.

BIG EYE aircraft normally utilized an anchor point (Alpha) at approximately 1925N/10725E. Average radar range is 175-180nm, which provided coverage on an arc to the SW, W, and NW around Hanoi. (Aircraft have been consistently detected in the traffic pattern at Hanoi.) Although this coverage does not include Dien Bien Phu, obvious intercept launches from there can be detected even though the intercept area may be out of range.[36/]

MAD KING

To pinpoint the SAM sites in North Vietnam, an RB-57F was brought to Udorn, Thailand, in August 1965, to obtain high-altitude, long-range oblique photography. The first mission flew under the name GREEK GOD; subsequent missions used the name MAD KING. By mid-October, fifteen missions had been flown,[37/] but little useful information was gained.[38/]

SKY WAVE

CINCPACAF again directed the deployment of an RB-57F to Udorn, on or about 22 December 1965, for high-altitude, long-range obliques of the SAM's, border areas and coastlines.[39] The PACAF overall project name was MILD WIND; the deployment was called SKY WAVE[40] and was covered by PACAF OPORD 153-66. No useful results were obtained in fifteen sorties and the project ended February 1966.[41]

BANGO FLIGHT

BANGO FLIGHT was an RF-101 recon in support of F-105 alert aircraft scrambled on strikes in Laos and North Vietnam. Ten BANGO FLIGHT sorties were flown from Udorn during 9-22 July 1965. Earlier flights had been reported under YANKEE TEAM.[42] For non-F-105 related recon the term "Quick Reaction YANKEE TEAM" was used. For in-country use, an RF-101 is kept on daily recon alert, committed to be airborne within thirty minutes. Late in the day, if it has not been scrambled, it is sent on a preplanned mission.[43]

WILD WEASEL

WILD WEASEL is a hunter-killer operation aimed at the destruction of SAM's. Four two seater F-100's, with the back seat occupied by special radar detecting and vectoring gear, were deployed to SEA. The F-100F's would detect SAM-associated FAN SONG radar and direct fighter bombers to the attack.[44] The first successful use of this armed reconnaissance occurred on 22 December 1965.[45]

RF-4C

For the Phase I buildup, which followed the Secretary of Defense's July 1965 visit, it was decided to provide the most modern reconnaissance aircraft in the USAF inventory. Implementing that decision, the 16th Tactical Reconnaissance Squadron, with RF-4C's, was brought to Tan Son Nhut. The first increment of nine aircraft arrived in October 1965 and the second nine in December.[46/]

For Phase IIA, ten RF-4C's arrived at Udorn, Thailand, in July 1966. They were designated the 6461st TRS.[47/] When they are joined by 14 additional aircraft in October, the entire unit will become the 11th TRS with a UE of 24 RF-4C's.[48/] In addition, the 12th Tactical Reconnaissance Squadron, with 18 RF-4C's, was due at Tan Son Nhut in August 1966.[49/] Thus, by October 1966, the SEA RF-4C structure would show two 18-aircraft squadrons, the 16th and 12th Tactical Reconnaissance at Tan Son Nhut; and one 24-aircraft squadron, the 11th Tactical Reconnaissance at Udorn. That would mean 60 RF-4C's in theater. In addition to the high-performance characteristics of the aircraft, the special reconnaissance features include the more modern infra-red system, the side-looking radar (SLR), and the forward looking radar (FLR).[50/] (See Appendex C, "Data on Basic USAF Reconnaissance Equipment in SEA", for details.) Although the AN/AAS-18 IR is the most modern in USAF's SEA inventory, it still is necessary to fly at low altitudes for good resolution. The FLR presents the terrain ahead of the aircraft and permits the pilots to fly low altitudes more

safely, especially at night. Because of the quality of the IR and this FLR feature, more IR photography (called RED HAZE) is now flown by RF-4C's.

While the Phantom has an AN/APQ-102 SLR, it has not been used frequently in SEA. The side-looking airborne radar (SLAR) of the Army Mohawk, the OV-1B, has generally performed this function; however, the RF-4C SLR is the only all-weather, day or night reconnaissance in SEA.[51/]

The RF-4C also has a photo-flash capability, but heavy moisture content of the air and dense foliage in SEA decreased the altitude from which it can be effectively used. The following chart indicates the difficulty:[52/]

PHOTO-FLASH DEGRADATION

Flash Cartridge	Altitudes Specifications	Effective
M112	3,500'	1,500'
M123	8,500'	4,000'

However, good results at lower altitudes have been obtained, as can be seen from photograph on page 46 . Since the bulk of the Viet Cong movement and the infiltration through North Vietnam and Laos is at night, this is an extremely important capability.

Second Air Division analyzed the early results of the 221 reconnaissance missions flown by the initial nine RF-4C's from their arrival on 30 October 1965 through 24 November. Of the 221 missions, 21 were multi-sensor (IR/SLR and photo), 20 SLR only, seven photo only (KS-72

and KA-56), (see Appendix C, "Data on Basic USAF Reconnaissance Equipment in SEA," for details) and the remainder IR only. Detailed results were:[53]

KA-56: Four flown; all successful.

KS-72: Seven flown; three good results, four poor. (Camera malfunctions were noted on three of the four classified as poor. Causes were not significant.)

SLR: Eighteen flown; 12 almost complete coverage with good results. Reasons given for poor results on six missions were: weather, no film loaded in SLR magazines, magazine malfunctions, V/H altitude too high for altitude flown, and miscalculation of film consumption (MTI mode).

IR: One-hundred and ninety-nine flown; ninety-seven good results. Reasons given for less than good results were: improper VH settings, fogged film (excessive heat), and system malfunctions.

The IR product was generally good and the SLR was fair to good. Processing time for either was approximately 20 minutes, with an additional 45 minutes required for correlation of the data base film.

Interpretation time varied from 30 minutes to seven hours, depending on the mission complexity, desired essential elements of information (EEI), and the geographical area. There were 6,930 fires or other heat source returns annotated and 2,590 annotations of suspected Viet Cong activity.

On 13 November 1965, IR annotations were used as an intelligence source by the 1st Infantry Division, which mounted an attack in the Ban Bang area resulting in 198 Viet Cong dead (by body count), and two truck loads of captured weapons.

On 7 November 1965, the area where 15 pinpoint annotations were noted was struck and a Viet Cong ammunition factory was found. On six other occasions, IR returns were used for artillery or infantry attacks.[54]

RED HAZE

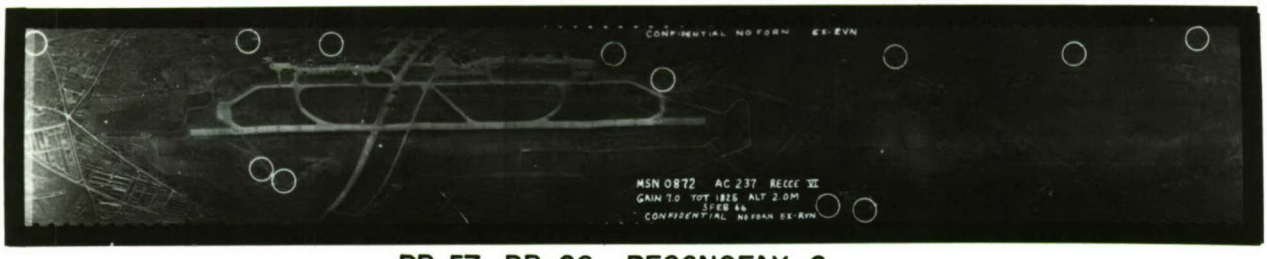
Infra-red photography in SEA is referred to as RED HAZE. This photography is flown by the RB-57E, the RF-4C, and the OV-1C (the Army Mohawk). (See Appendix C, "Data on Basic USAF Reconnaissance Equipment in SEA", for details.) The Army Mohawk IR (AN/UAS-4) has a different micron range than the RB-57, is more capable of detecting intense heat sources and uses the full width of film. It also has a cockpit readout.[55] The RF-4C has a better IR set (AN/AAS-18), but lacks cockpit readout. Both the Mohawk and the RF-4C are employed in RED HAZE. The FLR of the RF-4C enables it to get reasonably low, but not low enough in mountainous terrain to detect small targets. The IR photograph of Tan Son Nhut on page 48 illustrates the capability of USAF IR equipment in SEA.

In counterinsurgency operations, IR may be used to detect cooking, lighting and sentry fires, water and roadway (limited) surveillance, manufacturing activity, some trail detection, and agricultural and vegetation studies. The photo on page 49 is an IR depiction of a possible Viet Cong camp site against which air, artillery, or infantry action might be taken. In March 1965, 124 target areas were flown of which 111 were accepted.[56]

AF RED HAZE EQUIPMENT IN RVN

RB-57 RS-7

RB-57 RECONOFAX 4

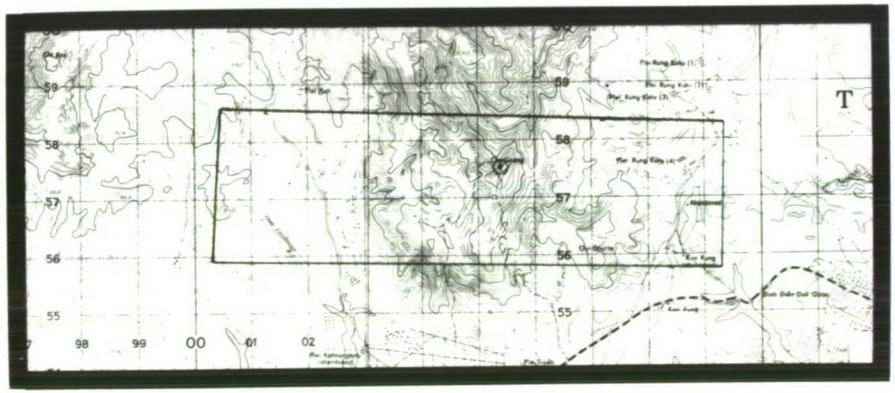


RB-57 RB-66 RECONOFAX 6

RF4C AN/AAS-18

AN/AAS-18 INFRARED SENSOR

POSSIBLE VC CAMP SITE



16TRS/13RTS

MACV gave considerable publicity to the effectiveness of IR in detecting cooking fires, even under forest cover. Later, a Viet Cong directive to control cooking was uncovered.[57] There have been reports that the Viet Cong dispersed units to avoid IR detection.[58]

By summer of 1966, the 13th Reconnaissance Tactical Squadron, at Tan Son Nhut, had reduced the IR processing time to an average of about one hour. The jointly-manned Air Force/Army IR interpretation team of the 13th Reconnaissance Tactical Squadron, which interprets the USAF-flown IR, takes about one additional hour. With a direct line to III Corps, they can call reports on urgent items within three hours after the aircraft is over target. Three shifts of five men each handle about ten missions per day in the rainy season; about 30 in the dry. Time is important and there must be continued effort to obtain and utilize the perishable intelligence.[59]

RED HAZE has added a new tool for that most difficult of counter-insurgency tasks - locating the enemy. As Captain Richard D. Valen stated:[60]

> "During the past seven months as Reconnaissance Officer in the II Corps DASC (Direct Air Support Center), I have been very favorably impressed with the RED HAZE support that we have received. This began with the Highway 19 (Freeway) Operation and has continued during every major operation since. This support has also included the day-to-day RED HAZE effort to locate and pinpoint positions of the Viet Cong operating here in the highlands and more recently, the newly infiltrated PAVN (People's Army of North Vietnam) units. RED HAZE has proven to be one of the most accurate, timely, and technically reliable methods of locating enemy activity in the counterinsurgency environment.

"... During the battle at Plei Me Special Forces Camp, the RED HAZE effort proved invaluable in locating the withdrawal of the PAVN units and made it possible to maintain contact for an extended period of time. Your RED HAZE people can rightfully be proud of the part they played during this historic battle . . ."

DARK EAGLE

In the summer of 1965, an ARPA team had flown a C-47 with IR over targets in Thailand. Their tests provided the following information:[61]

"Normal operating altitude for night reconnaissance using infrared is currently 2,000 to 3,000 feet. Using the AAS-18 scanner (currently producing between three to six milliradians resolution), this limits detection to fires and large water traffic. We have conclusive proof targets such as trucks in Laos are not detectable at these altitudes."

". . . Our tests in Thailand demonstrated conclusively the capability to detect personnel at an altitude of 500 feet, using a one to two milliradians system . . . ."

"As a compromise of coverage, navigational problems and flying safety, 2,000 feet is likely to be the lowest normal operating altitude in South Vietnam or Laos.

". . . We, therefore, look to the capability of 0.5 milliradian systems such as the RS-10 to provide this information."

Following the ARPA tests, DARK EAGLE, a project involving an RB-57 equipped with an AAS-18 infra-red set with a Real Time Viewer (RTV) and tape recorder was proposed. Second Air Division recommended this configuration be tested[62] and, in December 1965, PACAF approved.[63]

In addition, DARK EAGLE is evaluating Side Looking Radar for Tactical Reconnaissance. Since SLR represents the only all-weather photo reconnaissance capability in SEA, it has the potential of being especially

useful during the monsoon season. Initial tests have detected several apparent convoys in southern North Vietnam. Once a data base is established, it is expected the team will be able to identify many lucrative targets even during inclement weather.[64]

The photos on page 53 show some of the SLR test results.

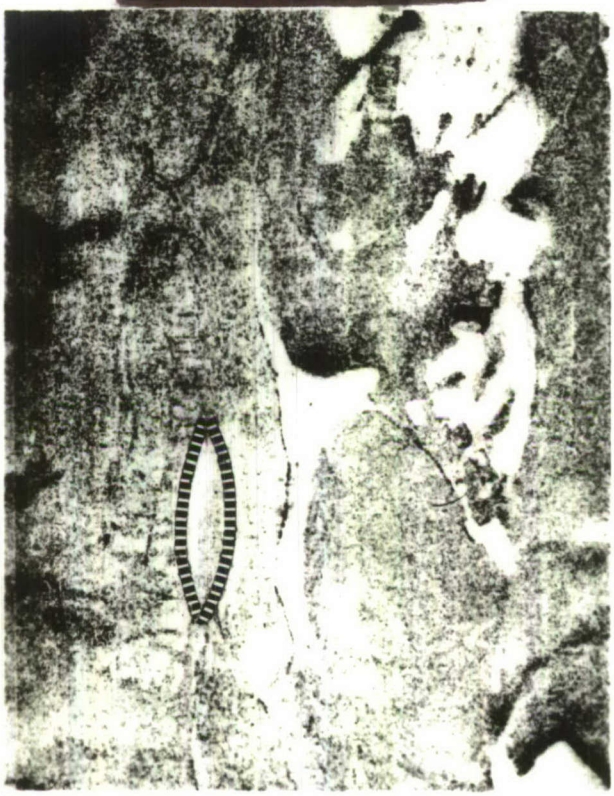
PHOTO C-1 shows a segment of a SLR mission flown on 21 April 1966, in the vicinity of Phuong Gia at 1706N/10701E. TOT was 0420L. The circled area denotes a section of a secondary road off Route #1; note that there are no strong returns on the road segment.

PHOTO C-2 shows the same general area except that this SLR photo was taken on 22 April 1966 and the TOT was 0207L. Note that on the same section of road we now have six to eight strong returns indicating heavy road traffic.

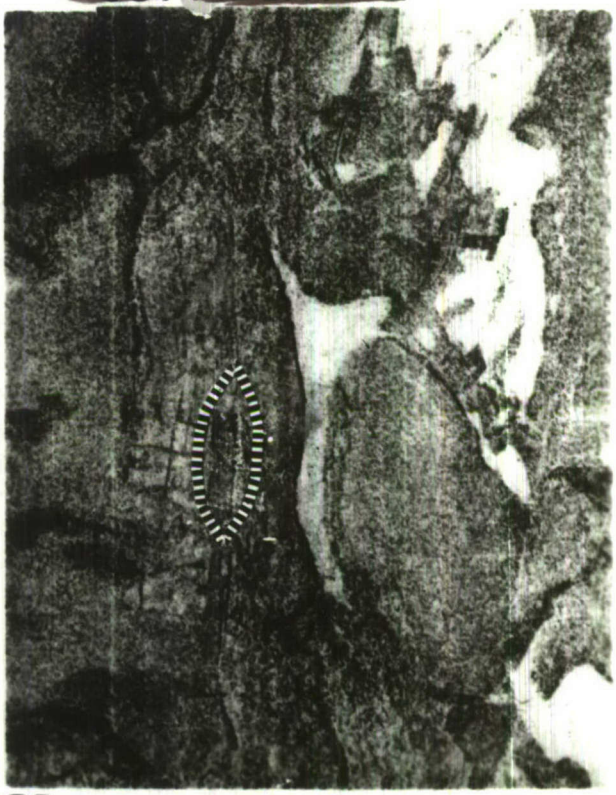
PHOTO B-1 shows a portion of a SLR mission flown on 25 April 1966 in North Vietnam on Route #1A approximately 1.5 miles south of Dong Hoi at 2335L. No comparative coverage was available. Note that there are approximately 15 strong returns in the circled area indicating possible truck activity.

HAWK EYE

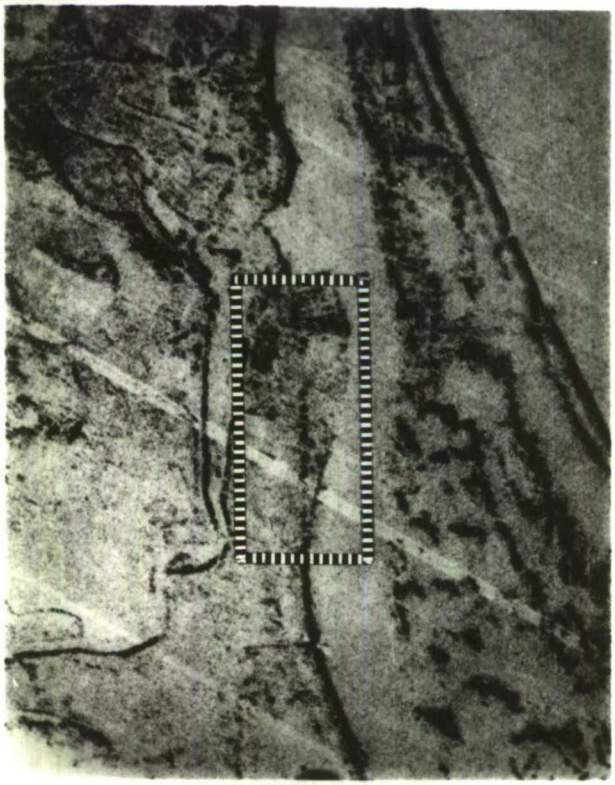
In February 1964, Project HAWK EYE brought an RC-47 with an Airborne Radio Direction Finding (ARDF) capability to Tan Son Nhut. This plane was used to find low-power transmitters of the enemy and thus pinpoint VC positions. The HAWK EYE aircraft was returned to CONUS for modification in July 1964, and was not returned to Tan Son Nhut until October 1965. During December and January, it flew numerous sorties, including the 13 December detection of a Viet Cong battalion in the Michelin Plantation, but basically, it was a test aircraft.[65]



C1



C2



B1

PHYLLIS ANN

The HAWK EYE test gave promise of helping solve the basic problem of counterinsurgency - that of finding the enemy. In January 1966, MACV stated a requirement for an additional 1256 hours of ARDF per week.[66] The MACV plan for this increased program would utilize U-6 and U-8 aircraft. The Air Force plan would employ the C-47.

PACOM appeared ready to accept MACV's position and request only U-6/U-8 aircraft, when an Air Force briefing of CINCPAC stressed the advantages of the improved C-47 program.[67]

The Army aircraft used aural null techniques which required the plane to fly a pattern (which might reveal its mission) during which transmission had to be sustained. The C-47 ARDF program used Phase Angle Discrimination (PAD), which took angle measurements automatically in less than one second. PHYLLIS ANN, the improved C-47 program, included side-calibration so that fixes could be obtained in any direction without turning the aircraft. Thus, the mission was not compromised and the "quick shut-down" transmitter could be detected.

CINCPAC accepted the C-47 program and USAF stated that "this program is of the utmost importance to USAF and requires extraordinary action by all organizations and personnel concerned".[68] In March 1966, USAF directed 35 additional C-47's added to the one in place.[69]

In April, the 360th Reconnaissance Squadron was assigned to Tan Son Nhut. The first RC-47 arrived in May with the full quota of 17 programmed to be in place by September 1966.[70]

The 361st Reconnaissance Squadron was assigned to Nha Trang. The first aircraft was to arrive in July 1966, and a strength of nine to be attained by September.[71] Detachment 1 of the 361st, with nine RC-47's, was to be based at Hue Bai.[72] The plan, as of July 1966, was to have the 17-plane 360th Reconnaissance Squadron at Tan Son Nhut; a 15-plane 361st Reconnaissance Squadron at Nha Trang; and, Detachment 1, 361st Reconnaissance Squadron at Pleiku with an additional 15 planes.[73]

In view of the compromise of effectiveness resulting from publicity of RED HAZE, special effort is being made to prevent disclosure of the PHYLLIS ANN mission.

SPECIAL RECONNAISSANCE

Other special reconnaissance will be mentioned only briefly because of sensitivity. DRILL PRESS, a project involving two JC-47's arrived at Tan Son Nhut in January 1966.[74] It is operated by 460th TRW with technical crews provided by the 6994th Security Squadron.

Four EC-130's arrived in September 1965 to establish SILVER DAWN, operated by the 6091st Reconnaissance Squadron, Yokota, Japan.[75] They are scheduled for two missions daily across the Gulf of Tonkin from

their base at Da Nang.[76] BOX TOP is the name for the three monthly flights made by a SAC RB-47 over the Gulf of Tonkin.[77]

TROJAN HORSE is SAC U-2, high-altitude, vertical photography. BLUE SPRINGS is the SAC C-130 drone program from Da Nang and Bien Hoa. JADE KING is an especially sensitive reconnaissance program.

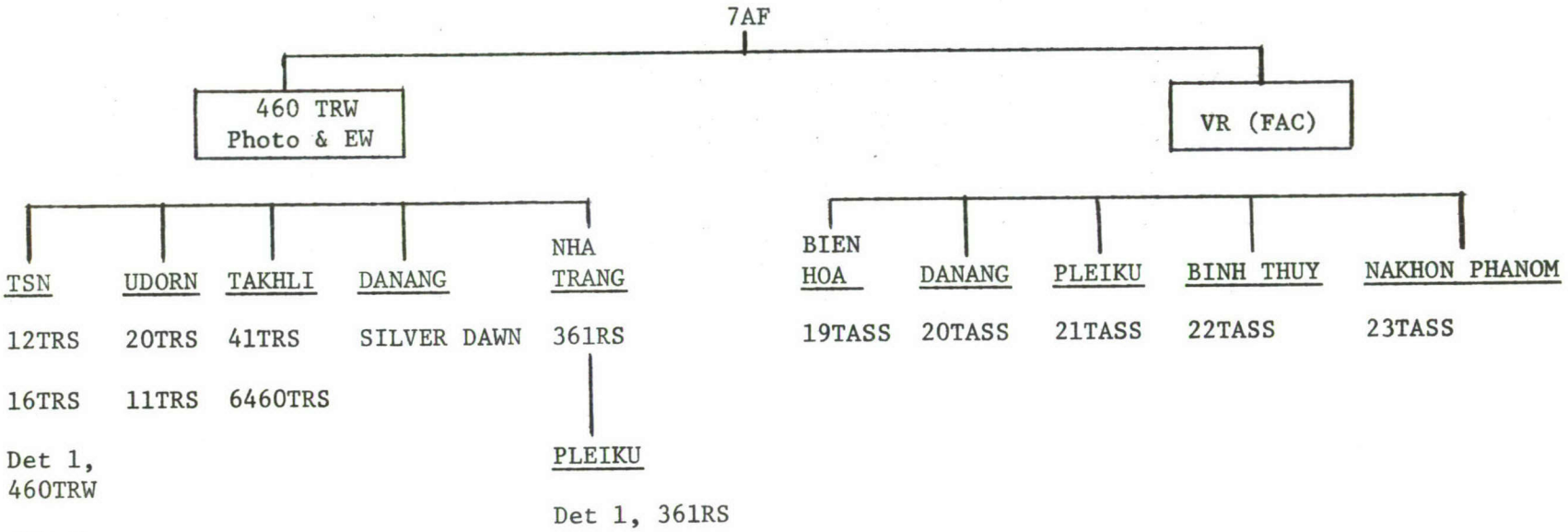
460TH TACTICAL RECONNAISSANCE WING

In the winter of 1966, the organizational pattern of the reconnaissance units under 2AD control were split three ways: (1) Geographically, (2) For Command and Control, and (3) For Support. To provide a cohesive organization, Second Air Division requested a PCS Tactical Reconnaissance Wing structure for SEA.

PACAF approved the proposed organization in January 1966 stating, "It is mandatory to establish a single Tactical Reconnaissance Wing at Tan Son Nhut to provide supervision of all reconnaissance activities in SEA".[78] PACAF SO G-41 established the 460th Tactical Recon Wing at Tan Son Nhut effective 18 Feb 66.[79] The following units were assigned:[80]

13th Reconnaissance Tactical Squadron
16th Tactical Reconnaissance Squadron
20th Tactical Reconnaissance Squadron
41st Tactical Reconnaissance Squadron
460th Field Maintenance Squadron
460th Organizational Maintenance Squadron
460th Armament & Electric Maintenance Squadron
Detachment 1, 460th Tactical Reconnaissance Wing
Detachment 2, 460th Tactical Reconnaissance Wing

ORGANIZATION OF USAF RECONNAISSANCE IN SEA



SOURCES: 7AF (Comptroller), "Command Status," May 1966, pp 9 & 14, 7AF (DO), "Recert, Approved & Proposed Action & Special Notes," 27 Apr 1966. Miscellaneous.

Since activation the following units have been added:

11th Tactical Reconnaissance Squadron
12th Tactical Reconnaissance Squadron
45th Tactical Reconnaissance Squadron
360th Reconnaissance Squadron
361st Reconnaissance Squadron
6460th Tactical Reconnaissance Squadron

The chart on page 57 shows the units assigned to the 460th Tactical Reconnaissance Wing and in addition it shows the organization of USAF visual reconnaissance in SEA.

The 460th Wing Commander, currently Colonel Edward H. Taylor, is responsible to the Commander, 7AF, for the conduct of USAF aerial reconnaissance in SEA. There is a Wing Tactical Unit Operations Center (TUOC) which functions as a coordinating and control point. The wing, with its nine tactical flying squadrons, is the largest in Air Force history. By the end of 1966, it will have approximately 200 aircraft.[81] USAF has approved the activation of a second wing, the 432d TRW, at Udorn in September 1966.

RECONNAISSANCE TACTICS

Tactical air came into SEA with the belief that low altitude was the secret to success, particularly because of the danger of SAM's. The tremendous amount of ground fire encountered in North Vietnam has caused a revision of this thinking.

Reportedly, Major Harry V. Runge, 15th Reconnaissance Task Force, originated the new tactic,[82] the "pop-up", which provides both maximum

survivability and increased photographic coverage in heavily defended areas. The basic "pop-up" procedure (for the RF-101) is as follows:[83/]

1. Select all low-altitude high-speed cameras, and automatic mode together with high altitude split verticals.

2. Approach the target at 100-500 feet AGL and 480-540 knots.

3. Five miles prior to the target, initiate a 2½-3G pull up. At 30 degrees, turn the cameras on and go into afterburner.

4. Maintain a 30 degree climb angle, locate your target in the viewfinder, and use aileron to center your target.

5. After the target passes through the bottom of the viewfinder at approximately 12,000 feet, roll over, lower the nose through the horizon, come out of afterburner, establish a 35-40 degree dive angle, and return to low altitude.

This maneuver avoids SAM's on the way to the target, avoids heavy ground fire in the target area, and gains more photo coverage than the low-level pass. Imaginative pilots have developed other versions of the basic "pop-up".

CHAPTER III

SUMMARY

Planning through 1966 has programmed 182 USAF recon aircraft in SEA. This total will consist of three RF-4C squadrons, two squadrons each of RF-101's, EB-66's, and RC-47's, plus support aircraft; more than twice the USAF capability in Korea. (Appendix A, "USAF Reconnaissance Aircraft in SEA," December 1966 section, shows distribution.) These aircraft have day and night photo, infra-red, side-looking radar, radio direction finding, ELINT, and COMINT capabilities. (Appendix C, "Data on Basic Reconnaissance Equipment in SEA," gives more detailed information.)

Operationally, the USAF has lost 25 recce planes in SEA. Sixteen to ground fire, four possibly to SAM's, and five to unknown factors. One each aircraft was lost in 1961, 1963, and 1964; eleven in 1965 and eleven by 20 July 1966. (Appendix B, "USAF Reconnaissance Losses in SEA".)

In the last six months of 1965, the Army submitted 3189 requests for in-commission recon of which the Air Force completed 2576. In the final three months, the figures were 2070 and 1555 for a monthly average of 690 requests and 518 completion.[1/]

By 31 May 1966, USAF had flown 2047 BLUE TREE and 4214 YANKEE TEAM recon sorties. Those two, plus all other recce sorties flown between 9 July 65 and 31 May 66 totaled 8315. (Appendices D & E provide a breakdown of this information.)

Appendix F shows the sorties and targets for the four major types of USAF recon aircraft in 1965. In that year, the RF-101 flew 2480 sorties, the RF-4C 535 (arrived in October), RB-57E 1036, and the RB-66B 679 (arrived in April). These four aircraft flew a total of 4730 sorties, completing 7671 targets. Of these 2817 were day photo area cover, 2676 were infra-red, and 2178 were pinpoints, strips, or SLR.[2/]

Appendix G is a detailed analysis of USAF sorties during May 1966. Here we see that the fighter-type recce, the RF-101 and the RF-4C, are flown both in- and out-country; the RB-57E is flown in-country; and the RB-66's are flown out-of-country. Night sorties account for 28 percent of the total. Weather caused more than 40 percent of the out-country sorties to be ineffective.[3/]

As a result of these efforts, the 13th RTS at Tan Son Nhut was producing in the neighborhood of three million feet of photography per month; Det 1, 13th RTS, at Udorn, about one-half million feet.[4/]

"Select Prints," those prints that cover items of significant intelligence interest, are presently distributed in 39 copies for YANKEE TEAM missions and in 31 copies for BLUE TREE missions. For each B-52 strike (ARC LIGHT) 54 copies of a 20" x 40" mosaic are distributed. The IPIR is distributed to 44 electrical and 50 mail addresses.[5/] (See Appendix H.)

PACAF attempted to analyze the value of reconnaissance in SEA in the following statement:[6]

> "In general, it can probably be concluded that the magnitude of these overall requirements exceeds, by several factors, the historic ratio of reconnaissance workload to air and ground operations previously employed in any war in which the U.S. has been involved. On the surface, it appears that Army requirements far exceed the practical usability of the vast numbers of prints being produced. The value, therefore, can well exceed the cost expended. (ED: The cost can well exceed the value gained!) Regardless, the emerging pattern of reconnaissance requirements to support the kind of military effort being expended in SEA appears to be generating a force level requirement which should be considered for future planning.
>
> "It can also be concluded that some form of control must be planned for and exercised under joint doctrine to preclude abuse of the reconnaissance resources and systems."

REQUIREMENTS

In determining intelligence requirements, the environment and the target must be examined. In the SEA environment, there are three elements: darkness, weather, and jungle. Recce must be able to penetrate all three.

Referring to night capability, the Tri-Command Conference stated:[7]

> "To effectively accomplish movement along LOC's in Laos and DRV the enemy has been forced to rely increasingly upon night activity to avoid aerial attack. Intelligence estimates approximately 80% of vehicular traffic is at night. Night armed reconnaissance and LOC interdiction have not effectively choked this traffic."

Currently, the SLR represents the sole all-weather capability; there is no ability to penetrate dense jungle.

In terms of the target, the two basic types are fixed and transient. Generally speaking, recon does quite well with the fixed types such as ROLLING THUNDER strike targets and photos for the planning of ground operations. Much of the recce product is derived from these. When compared to past wars, the increased workload appears justified. Most would agree it is desirable to have photos of landing zones and avenues of approach. The increased utilization of modern recon would appear as normal as does the use of more trucks and helicopters. It follows that the desire for timely photography of defending AA sites, a target, or of the sharpened stakes in a helicopter landing zone is equally justified.

Referring to the problem of the mobile target (unfortunately, the key to counterinsurgency operations), the 2AD Operations Analysis Division stated:[8/]

> "A successful COIN operation can be measured by the success of the intelligence operations. Any deficiency in this system is easily discovered by reviewing 'After Action Reports' or examining the results of air strikes. In RVN these reviews do indicate that adequate pre-strike and post-strike intelligence is not available or organized so as to guide air operations."

In COIN operations the mobile targets are small troop units. In interdiction, the mobile targets are primarily trucks. The small size of these targets require a recon sensor system with excellent resolution.

Also, due to the transient nature of mobile targets, the recon process must be fast - thirty minutes at most. At present it is 2-3 hours.[9] As a 7AF recon officer stated in his end of tour report:

> "Responsiveness is the key to the recon cycle and new and better ways are constantly being sought to improve the speed of response . . . ."

The perfect reconnaissance system would be day/night, all-weather, high resolution, fast, and jungle penetrating. Improvements have been made and research continues in these areas.

The November 1965 PACAF Commanders' Conference focused on specific requirements:[10]

1. Improved equipment for PPC's to include mobility and effectiveness.

2. Development and procurement of real time readout recce.

3. Development of follow-on ELINT/ECM capabilities.

4. A firm concept of operations for tactical ELINT.

In addition, Southeast Asia Operational Requirements (SEAOR's) have been submitted. One (for a data link for IR from an RF-4C, via airborne relay if necessary, to a readout station up to 350nm away) would provide hard copy within one minute and artillery could be on target within ten minutes of overflight. Strike aircraft could be contacted immediately.[11]

Other subjects under development or consideration are Forward Looking Infra-Red, Low Light Level Television (LLLTV), RS-10 high resolution infra-red, Real Time Viewers (RTV), and laser cameras.[12/]

The conflict in Southeast Asia has challenged the intelligence community. Reconnaissance has accepted this challenge as evidenced by the increased mission capability and the proven results of these missions.

(This page is UNCLASSIFIED)

G L O S S A R Y

AAA	Anti-Aircraft Artillery
ABCCC	Airborne Battlefield Command and Control Center
ABS	Air Base Squadron
A/C	Aircraft
AC&W	Aircraft Control & Warning
ADVON	Advanced Element
AFB	Air Force Base
AGL	Above Ground Level
AI	Air Intelligence
AIRA	Air Attache
ALO	Air Liaison Officer (USAF)
AOC	Air Operations Center
ARDF	Airborne Radio Direction Finding
ARLO	Air Reconnaissance Liaison Officer (USA)
ARPA	Advanced Research Projects Agency
ARVN	Army Republic of Vietnam
ASOC	Air Support Operations Center
BDA	Bomb Damage Assessment
CAS	Controlled American Source
CHECO	Contemporary Historical Evaluations of Combat Operations
CIA	Central Intelligence Agency
CICV	Combined Intelligence Center, Vietnam
CINCPAC	Commander-in-Chief, Pacific
CNX	Cancelled
COIN	Counterinsurgency
COMINT	Communications Intelligence
COMUSMACV	Commander, US Military Advisory Command, Vietnam
CONUS	Continental United States
CSAF	Chief of Staff, Air Force
CSG	Combat Support Group
DASC	Direct Air Support Center
DCS	Deputy Chief of Staff
DET	Detachment
DI	Director of Intelligence
DIMR	Directorate of Intelligence, Target Materials/Reconnaissance Support Division, Recon Requirements Branch
DIT	Directorate of Intelligence, Targets Division
DMZ	Demilitarized Zone
DO	Director of Operations
DOCO	Deputy for Operations, Combat Operations Directorate (Out-Country)
DOPR	Deputy for Operations, Plans & Requirements
DRV	Democratic Republic of Vietnam (North)

ECM	Electronic Counter Measures
EEI	Essential Elements of Information
ELINT	Electronic Intelligence
EW	Electronic Warfare
FAC	Forward Air Controller
FLIR	Forward Looking Infrared
FLR	Forward Looking Radar
GO	General Order
IPIR	Immediate Photo Interpretation Report
IR	Infrared
JCS	Joint Chiefs of Staff
JTF	Joint Task Force
JRATA	Joint Research and Test Agency
KBA	Killed by Air
LLLTV	Low Light Level Television
LOC	Line of Communication
MACV	Military Advisory Command, Vietnam
MIA	Missing In Action
MIBARS	Military Intelligence Battalion (Air Reconnaissance Support)
MTI	Moving Target Indicator
MO	Movement Order
NVN	North Vietnam
NSC	National Security Council
OPORD	Operation Order
PACAF	Pacific Air Forces
PACFLT	Facific Fleets
PACOM	Pacific Command
PAD	Phase Angle Discrimination
PCS	Permanent Change of Station
PDJ	Plaine des Jarres
PI	Photo Interpretation (or Interpreter)
PL	Pathet Lao
PPC	Photo Processing Cell
RAND	RAND Corp of Santa Monica, California
RBS	Radar Bombing System
RLAF	Royal Laotian Air Force
RTAF	Royal Thai Air Force

RTF	Reconnaissance Task Force
RTS	Reconnaissance Technical Squadron
RVN	Republic of Vietnam (South)
SAM	Surface to Air Missile
SAW	Special Air Warfare
SAWC	Special Air Warfare Center
SEA	Southeast Asia
SEAOR	Southeast Asia Operational Requirement
SEASIA	Southeast Asia
SLAR	Side Looking Airborne Radar
SLR	Side Looking Radar
SO	Special Order
SSB	Single Side Band
SVN	South Vietnam
TAC	Tactical Air Command
TACC	Tactical Air Control Center (In-Country)
TACS	Tactical Air Control Squadron
TARC	Tactical Air Reconnaissance Center
TASS	Tactical Air Support Squadron
TDY	Temporary Duty
TIC	Target Intelligence Center
TOT	Time on Target
TRAC	Target Research and Analysis Center
TSN	Tan Son Nhut
TUOC	Tactical Unit Operations Center
USAF	United States Air Force
VC	Viet Cong
VM	Viet Minh
VNAF	Vietnamese Air Force
VR	Visual Reconnaissance
WX	Weather

APPENDIX A

USAF RECONNAISSANCE AIRCRAFT IN SEA

AIRCRAFT	NR	UNIT	CHANGES
1961 CHRONOLOGY			
VIENTIANE			
SC-47	1*	AIRA	Arr Jan 61. * Shot down Mar 61.
DON MUANG			
RT-33	1**	FIELD GOAL	Arr Apr 61. ** Became courier Nov 61.
RF-101	4	ABLE MABLE	Arr Nov 61 from 45 TFS.
TAN SON NHUT			
RF-101	4***	15RTF	Arr Oct 61 from 15 TRS. *** Dep Nov 61.
Total as of December 1961 - 4 Aircraft.			
1962 CHRONOLOGY			
TAN SON NHUT			
RF-101	4	ABLE MABLE	Arr at TSN from Don Muang Dec 62. 45 & 15 RTFs rotate, 15 RTF from May - Nov 62.
RB-26L	2	BLACK WATCH	Arr Don Muang May 62; sent to TSN Dec 62.
RB-26	2*	FARM GATE	Arr May 62. * Sent to FARM GATE.
Total as of December 1962 - 6 Aircraft.			
1963 CHRONOLOGY			
TAN SON NHUT			
RF-101	4	Det 1, 33 Tac Gp	Designation from ABLE MABLE Jul 63.
RF-101	2	Det 1, 33 Tac Gp	Arr Apr 63.

1963 CHRONOLOGY (Cont'd)

TAN SON NHUT			
RB-26L	2*	Det 1, 33 Tac Gp	* One shot down Dec 63; Designation from BLACK WATCH Jul 63.
RB-57E	2	Det 1, 33 Tac Gp	Arr Apr 63; Designation from PATRICIA LYNN.

Total as of December 1963 - 9 Aircraft.

1964 CHRONOLOGY

TAN SON NHUT			
RF-101	6	Det 1, 33 Tac Gp	
RF-101	4	Det 1, 33 Tac Gp	Arr Jul 64.
RF-101	2	Det 1, 33 Tac Gp	Arr Aug 64.
RB-57E	2	Det 1, 33 Tac Gp	
RB-57E	1	Det 1, 33 Tac Gp	Arr Dec 64.
RB-26L	1*	Det 1, 33 Tac Gp	* Dep Apr 64.
RC-47	1*	HAWKEYE	* Arr Feb 64; dep Jul 64.

Total as of December 1964 - 15 Aircraft.

TAN SON NHUT			
RF-101	12	20TRS	Designation from 33 Tac Gp Jul 65; 45RTF Nov 65.
RF-4C	9	16 TRS	Arr Oct 65.
RF-4C	9	16 TRS	Arr Dec 65.
RB-57E	3	Det 1, 6250CSG	Designation from 33 Tac Gp Jul 65.
RB-57E	1	Det 1, 6250 CSG	Arr Jan 65.
RB-66B	4	Det 1, 41TRS	Arr Apr 65.
RC-47	1	HAWK EYE	Return Oct 65.

1965 CHRONOLOGY (Cont'd)

TAN SON NHUT			
EC-121	3	BIG EYE	Arr Apr 65.
EC-121	1	BIG EYE	Arr Oct 65.
UDORN			
RF-101	6	15RTF	Arr Apr 65.
RF-101	6	15RTF	Arr May 65.
RB-57F	1*	MAD KING	Arr Aug 65. * Dep Nov 65.
TAKHLI			
B-66B	5	Det 1, 25TRW	Arr Sep 65.
RB-66C	6	41TRS	Arr May 65.
RB-66C	3	41TRS	Arr Sep 65.
DANANG			
C-130B	4	SILVER DAWN	Arr Sep 65.

Total as of December 1965 - 43 Aircraft.

1 Jan - 30 Jun 1966 CHRONOLOGY

TAN SON NHUT			
RF-101	12	45RTF	Replace 20TRS Apr 66.
RF-4C	18	16TRS	
RB-57E	4	Det 1, 460TRW	Designation from Det 1, 6250CSG, Feb 66.
RB-66B	4*	Det 1, 41TRS	* Dep Apr 66.
RC-47	1	360 RS	Designation from HAWK EYE.
JC-47	2	DRILL PRESS	Arr Jan 66.
EC-121	4	BIG EYE	
UDORN			
RF-101	12	20TRS	From TSN Apr 66.
RF-101	4	20TRS	Arr May 66.

1 Jan - 30 Jun 1966 CHRONOLOGY (Cont'd)

TAKHLI			
EB-66B	5	6460 TRS	Designation from Det 1, 25TRW, Jun 66.
EB-66B	8	6460 TRS	Arr May 66.
EB-66C	9	41 TRS	
EB-66C	3	41 TRS	Arr May 66
DANANG			
EC-130B	4	SILVER DAWN	

Total as of June 1966 - 82 Aircraft.

PLANNED RECONNAISSANCE AIRCRAFT IN SEA THROUGH DEC 1966.

TAN SON NHUT			
RF-101	12	45 TRS	Designation from RTF, Jul 66.
RF-101	4	45 TRS	Due Jul 66.
RF-4C	18	16 TRS	
RF-4C	18	12 TRS	Due Aug 66.
RB-57E	4	Det 1, 460 TRW	
RC-47	17	360 RS	By Sep 66.
JC-47	2	DRILL PRESS	
EC-131	4	BIG EYE	
NHA TRANG			
RC-47	15	361 RS	By Nov 66.
PLEIKU			
RC-47	15	Det 1, 361 RS	By Dec 66.
UDORN			
RF-101	16	20 TRS	
RF-4C	10	11 TRS	By Jul 66.
RF-4C	14	11 TRS	By Oct 66.

PLANNED RECONNAISSANCE AIRCRAFT IN SEA THROUGH DEC 1966 (Cont'd)

TAKHLI			
EB-66B	13	6460 TRS	
EB-66C	12	41 TRS	
EB-66C	3	41 TRS	By Oct 66.
DANANG			
EC-130	4	SILVER DAWN	

Total as of December 1966 - 182 Aircraft.

APPENDIX B

USAF RECONNAISSANCE LOSSES IN SEA

As of 20 July 1966

DATE/CREW	A/C	UNIT	LOCATION	CAUSE	STATUS
1. 24 Mar 1961 Unk	SC-47	AIRA	Laos	Poss SAM	MIA
2. Dec 1963 Unk	RB-26L	Det 1	Unk	Gnd Fire	Unk
3. 21 Nov 1964 WALTZ, Burton L., Capt	RF-101	15 TRS (TSN)	Laos	Unk	Injured
4. 3 Apr 1965 MORGAN, Herschel S., Capt	RF-101	45 TRS (TSN)	1854/10516	Gnd Fire	MIA
5. 29 Apr 1965 SHELTON, Charles E., Capt	RF-101	15 TRS (Udorn)	2021/10400	AW/37mm	Detained
6. 6 May 1965 STUBBERFIELD, Robert, Capt	RF-101	45 TRS (TSN)	1703/10712	Gnd Fire	MIA
7. 29 Jun 1965 LINDSEY, Mervin N., Maj	RF-101	20 TRS (Udorn)	2120/10355	Gnd Fire	MIA
8. 29 Jul 1965 WETHERBY, Jack W., Capt	RF-101	45 TRS (TSN)	2155/10455	Gnd Fire	KIA
9. 5 Aug 1965 CRIST, Richard A., Capt, Nav DAMON, Richard E., Capt, Pilot	RB-57	6250 CSG (TSN)	Vic TSN	Gnd Fire	Both Injured

DATE/CREW	A/C	UNIT	LOCATION	CAUSE	STATUS
10. 13 Aug 1965 MELLOR, Frederio M., Capt	RF-101	363 TRW (Udorn)	10NM S Thanh Hoa	Gnd Fire (AW)	MIA
11. 27 Sep 1965 HALL, George R., Maj	RF-101	15 TRS (Udorn)	2010/10608	Gnd Fire	MIA
12. 5 Oct 1965 PITT, Robert, Capt	RF-101	15 TRS (Udorn)	2130/10621	Gnd Fire	Injured
13. 22 Oct 1965 MANN, Robert L., Capt, Pilot MCEWEN, James A., 1st Lt, Nav WEGER, John Jr., 1st Lt, Nav	RB-66	9 TRS	1415/10738	Unk	MIA
14. 1 Nov 1965 HUGGINS, Norman P., Capt	RF-101	20 TRS (Udorn)	2050/10729 Tonkin Gulf	Gnd Fire	Injured
15. 26 Jan 1966 GRUBB, Wilmer N., Capt	RF-101	20 TRS (TSN)	1738/10619	Gnd Fire	Detained
16. 25 Feb 1966 WALKER, Robert P., Maj, Pilot CAUSEY, John B., Capt, Obs BEATY, James K., 1st Lt, Raven KODLICK, John, Capt, Nav SMITH, Wayne H., Capt, Raven THOMSEN, James F., Capt, Raven	RB-66C	41 TRS (Takhli)	Ejected over water 1807/ 10718	Damaged by SAM	Causey MIA; Others injured.
17. 7 Mar 1966 PAGE, Gordon L., Capt	RF-101	15 TRS (Udorn)	Vinh Area	Pos SAM	MIA
18. 7 Mar 1966 WRIGHT, Jerdy A., Capt	RF-101	15 TRS (Udorn)	Vinh Area	Pos SAM	MIA
19. 21 Mar 1966 BURER, Arthur W., Capt	RF-101	45 RTF (TSN)	1921/10543	Gnd Fire	MIA

	DATE/CREW	A/C	UNIT	LOCATION	CAUSE	STATUS
20.	2 Apr 1966 DOUGHTY, Daniel J., Capt	RF-101	45 RTF (TSN)	1753/10552	Gnd Fire	MIA
21.	22 Apr 1966 BRUNSTRON, Allen L., Maj	RF-101	20 TRS (Udorn)	2142/10640	Gnd Fire	MIA
22.	26 Apr 1966 ANDERSON, Warren L., Capt TUCKER, James H., 1st Lt.	RF-4C	16 TRS (TSN)	1740/10616	Unk	MIA
23.	29 Apr 1966 RUNYON, Albert E., Maj	RF-101	20 TRS (Udorn)	2130/10445	Unk	MIA
24.	6 Jul 1966 YOUNG, James F., Maj	RF-101	20 TRS (Udorn)	2135/10551	Unk	MIA
25.	20 Jul 1966 MEANS, William H., Capt, Pilot HUBBARD, Edward L., 1st Lt, Nav NORBERT, Craig R., 1st Lt, Raven MC DANIEL, Norman A., Capt, Raven PERKINS, Gledon W., Capt, Raven BARBY, Lawrence, Capt, Raven	RB-66C	41 TRS (Takhli)	2200/10525	Poss SAM	MIA

SUMMARY

Aircraft Down

1961 - 1
1963 - 1
1964 - 1
1965 - 11
1966 - 11

By Ground Fire - 16
Possible by SAM - 4
Unknown - 5

APPENDIX C

DATA ON BASIC USAF RECONNAISSANCE EQUIPMENT IN SEA

I - RECONNAISSANCE AIRCRAFT

1. RF-101 is a twin-engine supersonic aircraft. Built by the McDonnell Aircraft Corporation, the RF-101 has a crew of one and is capable of providing day and night high and low altitude - visual and photographic reconnaissance in support of air and ground forces. The aircraft has an inflight refueling capability. Its nickname is Voodoo.

2. RF-4C is a twin-engine varied mission supersonic aircraft purchased by the Air Force for the reconnaissance task. Built by the McDonnell Aircraft Corporation, the RF-4C has a crew of two and is capable of providing day/night and all weather reconnaissance in support of air and ground forces. Equipment includes day and night cameras, infrared, side-looking and forward-looking radar sensors. Special features include inflight refueling capability, inflight photographic film processing, pinpoint inertial navigation system, HF, SSB communication system and inflight film cassette ejection system for delivery of the finished photo product to field commanders. Its nickname is Phantom.

3. RB-57E is a twin-engine varied mission sub-sonic aircraft built by Martin Aircraft Co. The RB-57 has a crew of two and is capable of providing day and night - high and low altitude - visual, photographic, and infrared reconnaissance in support of air and ground forces.

4. RB-66 is a twin-engine varied mission sub-sonic aircraft built by Douglas Aircraft Co. The RB-66 has a crew of three and is capable of providing day and night - high and low altitude - visual, photographic, and infrared reconnaissance in support of air and ground forces. For extended flight the aircraft has an inflight refueling capability.

II - AIRCRAFT PERFORMANCE

	SPEED			NAV	
	CRUISE	MAXIMUM[1]	RADIUS[2]	SYSTEM	COMMUNICATIONS
RF-101	480K	600K	400NM	APN-102 Doppler TACAN	UHF
RF-4C	510K	750K	300NM	AN/ANS-46, AN/APQ-99, TACAN	UHF HF SSB

	SPEED CRUISE	SPEED MAXIMUM[1]	RADIUS[2]	NAV SYSTEM	COMMUNICATIONS
RB-57	420K	480K	650NM	APN-102 TACAN	UHF HF SSB
RB-66	460K	575K	500NM	APS-27 Radar TACAN	UHF HF

NOTES: 1. Maximum level flight at 5000'.
2. Hi-Low-Hi profile with 30 minutes low in target area.

III - SENSORS

	PHOTO	IR	SLR/SLAR	OTHER
RF-101	KS-72 KA-56 KA-1	None	None	
RF-4C	KS-72 KA-55 KA-56 KC-1B	AN/AAS-18	APQ-102	APQ-99 ALR-17
RB-57	F-477 KA-56 KA-1 KA-2	RS-7 RECON VI AN/AAS-18	None	
RB-66	K-47	RECON VI	None	

IV - PHOTO EQUIPMENT DATA

		KS-72	RF-101 KA-56	KA-1
1. FOCAL LENGTH (INCHES)		3 6 12 18	3	36
2. CYCLING RATE (SECONDS)			6	1/1.5
3. AVERAGE DYNAMIC RESOLUTION: (LPM)	DAY	25 25 50 50	25	10
	NIGHT	18 18		
4. FILM SIZE (INCHES)		5	5	9
5. FORMAT (INCHES)		4.5 X 4.5	4.5 X 9	9 X 18
6. FILM CAPACITY (FEET)		500	1000	39
7. TOTAL COVERAGE (1:10,000) SQ NM STANDARD FILM + 25% WITH THIN BASE FILM		SV 372	V 638	SV 617
8. NIGHT PHOTO CAPABILITY		YES	NO	NO

	RB-57			RF-4C			RB-66
F-477	KA-56	KA-1	KS-72	KA-55	KA-56	KC-1	K-47
12	3	36	3 6 12 18	12	3	6	12
2	6	1/1.5	6	1/2	6	1/1½	1/7
15	25	10	25 25 50 50	30	25	15	15
5			18 18				5
9	5	9	5	5	5	9	9
9X9	1¼X9	9X18	4.5X4.5	4.5X18	4.5X9	9X9	4X9
390	1000	390	500	1000	1000	390	390
SV 612	V 638	V 309	SV 372	V 537	V 638	V 250	SV 612
YES	NO	NO	YES	NO	NO	NO	YES

V - INFRARED (IR) EQUIPMENT DATA

	RECONOFAX VI	RS-7	AN/AAS-18
AIRCRAFT MOUNTED IN	RB-57 & RB-66	RB-77	RF-4C
1. MANUFACTURER	H.R.B. SINGER	TEXAS INSTRUMENT	TEXAS INSTRUMENT
2. NR OF POSSIBLE RECORDING CHANNELS:	1	1	1
3. RECORDING MODES:	1	1	3
4. SCAN ANGLE (DEGREES):	140	140	120
5. WIDTH COVERAGE AT 2000 FT ALT (METERS)	2900	2900	2100
6. LINEAR COVERAGE 2000 FT ALT (NM)	575	825	700
7. MAXIMUM TARGET AREA COVERAGE AT 2000 FT ALT (SQ KM)	1690	2245	1918
8. FILM SIZE (INCHES)	2.7 (70MM)	2.7 (70MM)	5
9. RECORDED USABLE IMAGERY FORMAT (INCHES):	70MM	57MM	
10. FILM CAPACITY (FEET)	100	250	250
11. ANGULAR RESOLUTION (MILIRADIANS):	3	2	1 and 3 (1 down to 1000' altitude and 3 below 1000' altitude based on normal V/H factor.)

VI - SIDE-LOOKING RADAR (SLR) EQUIPMENT DATA:

		AN/APQ-102
1.	AIRCRAFT IN WHICH MOUNTED	RF-4C
2.	MANUFACTURER	Goodyear
3.	SPECTRUM	X-Band
4.	FILM SIZE	5"
5.	RANGE	10 to 30 NM
6.	MODES	(a) Low Altitude 500 to 5000 ft (1) High resolution map - 10 NM both sides. (2) Moving Target Indication (MTI) 10 NM - both sides. (3) High resolution MAP/MTI 10 NM on either side. (b) High Altitude 30,000 to 50,000 ft. (1) High resolution MAP-5 to 15NM both sides. (2) High resolution MAP-10 to 30NM on either side.
7.	RESOLUTION	50 ft in azimuth and range.
8.	STABILIZATION	Three-Axis Antenna Stabilization
9.	MOVING TARGET INDICATED (MTI)	5 NM per hour
10.	SCALE	1:392,000
11.	DATA RECORDING	Radar data recorded on 5" film requires ground processing and correlation.
12.	INFLIGHT READ-OUT	None
13.	AREA COVERAGE	4,000 sq NM high altitude.
14.	AREA COVERAGE HIGH RESOLUTION MAP/MTI	2,000 sq NM low altitude.
15.	LINEAR (NM) COVERAGE	394

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VII - FORWARD LOOKING RADAR (FLR) DATA

1.	AIRCRAFT IN WHICH MOUNTED	RF-4C
2.	MANUFACTURER	Texas Instrument
3.	RANGE	80 NM
4.	ANTENNA SCAN COVERAGE	$+5^{\circ}$ -15° elevation 90° azimuth
5.	MODES	(a) Terrain Following (b) Terrain Avoidance (c) Cross Scan (d) Ground Map (Low Alt) (e) Ground Map (High Alt)
6.	INFLIGHT READ-OUT	Front and rear cockpit scope read-out.
7.	RESOLUTION	Constant at all ranges estimated 20 feet.

APPENDIX D

USAF SORTIES BY PROJECT UNTIL - 6 JAN 1966

PERIOD	RT	UE	YT	SL	EW	BR	SVN	TOTAL
Until 8 Jul 1965		314	922					
9 Jul - 22 Jul	66	18	54	12	36	9	178	373
23 Jul - 5 Aug	91	12	50	5	44	6	183	391
6 Aug - 19 Aug	114	12	52	4	59	8	188	437
20 Aug - 2 Sep	94	20	49	7	57	2	199	428
3 Sep - 16 Sep	94	6	44	5	78	12	203	442
17 Sep - 30 Sep	141	24	99	2	49		192	507
1 Oct - 14 Oct	119	28	73		77		186*	483*
15 Oct - 28 Oct	118	16	76		78		186*	474*
29 Oct - 11 Nov	108	24	87		96		298	613
12 Nov - 25 Nov	113	14	86		81		339	633
26 Nov - 9 Dec	97	18	84		96		359	654
10 Dec - 23 Dec	97	6	107		73		303	586
24 Dec - 6 Jan	6	128	124	—	73	—	303	634
TOTAL 9 JUL 65 - 9 JUL 66	1258	326	985	35	897	37	3117*	6655*
CUMULATIVE TO 6 JAN 66		640	1907					

KEY: RT - ROLLING THUNDER (BDA & WX)
EW - ELECTRONIC WARFARE
SL - STEEL TIGER (BDA & WX)
UE - BLUE TREE
SVN - SOUTH VIETNAM
BR - BARREL ROLL (BDA & WX)
YT - YANKEE TEAM

* Figures Unclear

APPENDIX E

USAF SORTIES BY PROJECT 7 JAN - 31 MAY 1966

PERIOD	RT	UE	YT	SW	EW	PF	SVN	TOTAL
7 Jan - 20 Jan		266	147	8	107		333	861
21 Jan - 3 Feb	9	112	205	5	39	32	363	765
4 Feb - 17 Feb	16	106	272		106		326	826
18 Feb - 3 Mar		110	301		139		330	880
4 Mar - 17 Mar		113	256		113		349	831
18 Mar - 31 Mar		93	302		102		343	840
Apr		364	471		262		652	1749
May		243	353		270		697	1563
TOTAL 7 Jan - 31 May 1966	25	1407	2307	13	1138	32	3393	8315
CUMULATIVE TO 31 MAY 1966		2047	4214					

KEY: RT - ROLLING THUNDER
UE - BLUE TREE
YT - YANKEE TEAM
SW - SKY WAVE
EW - ELECTRONIC WARFARE
PF - PATHFINDER
SVN - SOUTH VIETNAM

SOURCE: PACAF (Tac Eval Center), "Summary Air Operations Southeast Asia, Volume XV to XXII".

APPENDIX F

USAF RECONNAISSANCE SEA SORTIES & TARGETS IN 1965

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
	SORTIES	144	148	165	173	124	173	220	196	226	306	295	310	2480
RF-101	TGT PER SORTIE	1.33	1.49	1.43	1.24	1.53	1.39	2.30	2.40	1.88	2.18	1.36	1.19	
	TGTS	191	221	214	215	190	240	506	470	425	667	401	369	4109
	SORTIES	0	0	0	0	0	0	0	0	0	3	277	255	535
RF-4C	TGT PER SORTIE	0	0	0	0	0	0	0	0	0	1.50	1.19	.89	
	TGTS	0	0	0	0	0	0	0	0	0	5	329	227	561
	SORTIES	72	58	77	61	84	66	94	102	96	96	102	128	1036
RB-57E	TGT PER SORTIE	2.9	1.9	2.0	2.20	1.72	2.36	2.0	2.19	2.19	2.56	1.65	1.21	
	TGTS	209	110	154	134	144	156	188	223	210	246	168	155	2097
	SORTIES	0	0	0	32	75	76	95	116	101	79	50	55	679
RB-66B	TGT PER SORTIE	0	0	0	.91	1.08	1.44	1.37	1.23	1.89	1.12	1.44	1.11	
	TGTS	0	0	0	29	81	109	130	143	191	88	72	61	904
USAF TOTAL SORTIES		216	206	242	266	283	315	409	414	423	484	724	748	4730
USAF TOTAL TGTS COMP		400	331	368	378	415	505	824	836	826	1006	970	812	7671

(This page is SECRET)

APPENDIX G

ANALYSIS OF SORTIES IN MAY 1966

I - IN AND OUT COUNTRY

AIRCRAFT	IN	OUT
RF-101	302	388
RF-4C	270	208
RB-57E	125	-
RB-66B	-	102
RB-66C	-	168
TOTAL	697	866

II - BY TYPE (In-Country)

AIRCRAFT	TOTAL	PHOTO	IR	SLR
RF-101	302	302	-	-
RF-4C	270	86	170	14
RB-57E	125	73	52	-
TOTAL	697	461	222	14

III - ROUND-THE-CLOCK

a. By Aircraft (In-Country)

AIRCRAFT	DAY	NIGHT	TOTAL
RF-101	302	-	302
RF-4C	87	183	270
RB-57E	69	56	125
TOTAL	458	239	697

b. In- And Out-Country

DESIGNATION	DAY	NIGHT	TOTAL
In-Country	458	239	697
Out-Country	543	323	866
TOTAL	1,001	562	1,563

NOTE: Night sorties account for 28 percent.

IV - WEATHER

a. North Vietnam

AIRCRAFT	% OF SORTIES FLOWN UNSUCCESSFUL WEATHER	% OF SORTIES FLOWN CANCELLED WEATHER
RF-101	26	52
RF-4C	7	27
TOTAL	19%	45%

b. Laos

AIRCRAFT	SORTIES SCHEDULED	FLOWN	SUCCESS	WEATHER UNSUCCESS	WEATHER CANCELLED
RF-101	491	237	187	47	176
RF-4C	292	116	83	22	93
TOTAL	783	353	270	69	269

NOTE: Weather caused 43 percent of the sorties in May 1966 to be ineffective.

SOURCE: PACAF (Tac Eval Center), "Summary Air Operations Southeast Asia, Volume XXII, May 1966.

APPENDIX H

7AF IPIR DISTRIBUTION LIST

CINCPAC

CINCSAC

COMUSMACV

CTF 79

CTG 79.3

CTG 79.4

CTG 77.3

CTG 77.4

CTG 77.5

CTG 77.6

CTG 77.7

DIA (DIAAO-3)

FICPAC

NPIC, Wash DC

PEC

3 ADIV

Det 1, 13 RTS

CEPAER, Canberra

388 TFW

35 TFW

8 TFW

366 TFW (DOI)

12 TFW (DOI) (IT)

ACTION (ELECTRICAL)

355 TFW (DOI)

Det 1, 7AF/13AF Thai, Nakhon Phanom

606 ACS (TUOC), Nakhon Phanom, Thai

USAIRA, Vientiane

630 CSG, Tuoc, Udorn

67 RTS

1 ACS, Tiger Hound Proj Off, Pleiku

Tiger Hound Projec Office, Da Nang

J-2, JCS

DASC, I Corps

ACTION (ELECTRICAL) ARC LIGHT FLT

DIAAP - IP, Wash DC

CSAF, Wash DC

4252 Strat Wg, Kadena AB, Okinawa

INFO (ELECTRICAL)

CINCPACAF

CINCPACFLT

CINCUSARPAC

COMSEVENFLT

USS Enterprise

548 RTS

CTF 77

DEP CHJUSMAG

13AF

ACTION (MAIL/COURIER)

MACV (CICV) (YT)
MACV (SOG) (YT)
7AF, TACC-TH (YT)
7AF (DI)
7AF (DIM)
7AF (DIT)
13 RTS (PCC-RSB)
13 RTS (TIC-P)
DIRMSA
2AF, Barksdale AFB, La
COMSEVENFLT, Det C, TSN
460 TRW (TGOC)
7AF (DOCO-B)
41 TRS (DCOI)
7AF (DIO-D)
7AF (DOCO-G)
7AF (DOTE)
460 TRW (DOI)
16 TRS (DCOI)
45 TRS
13 RTS (TIC-D)
FTD Det,903, Alpha, Clark
FTD Det, 903, Charlie, Clark.
8AF, Westover AFB, Mass
15AF, March AFB, Cal
1st MIBARS, TSN
VNAF (DCS/INT)

INFO (MAIL/COURIER)

ACIC, St Louis, Mo
CAS, Udorn, Thai
CAS, Vientiane, Laos
CG, FIRSTMAW
CG, FMFPAC
CG, II Corps, Okinawa
CHJUSMAG, Thai
CMC
CNO
TAC
13AF Clark AFB
13 PPC
USARPAC
COMNAVPHIL
COMOSTOC
CSA
CTF 76
FTD, WPAFB
Hq Comd, USAF
Joint Processing Cntr
National Indications Cntr
State RCI, Wash DC

7AF SELECT PRINT DISTRIBUTION LIST

ACTIVITY			YT	UE	RT(A)	RT(C)	IN
Hq 7AF	DIT (1) (2)	BDA	3	3	3	3	3
		SN/SL	3	3	3	3	3
	DIO (3)		1	1	1	1	1
	DOCO-E		1	1	1	1	1
	DOTE		1	1	1	1	1
CINCPACAF (DIEC) ATTN: LTC PAULMAN			1	1	1	1	1
13RTS (IIC)			2	2	2	2	2
13 RTS (TIC)			1	1	1	1	1
COMUSMACV_CICV (4)			1	1	1	0	1
COMUSMACV-SOG (4) (4) Tiger Hound Only			1	0	0	0	0
COMUSMACTHAI (MACV-J2)			1	1	1	0	1
USAIRA, VIENTIANE (3)			1	0	0	0	0
460TRW (DCI)			1	1	1	1	1
DET 1, 13RTS, Udorn			1	1	1	1	1
CG1MAW (JC of S/C-2) Da Nang		SN/SL	1	1	1	0	1
		BDA	3	3	3	0	3
606 ACS, TUOC, NAKHON PHANOM			0	1	1	1	1
13RTS (PPC/RSB)			1	1	1	1	1

7AF SELECT PRINT DISTRIBUTION LIST (Cont'd)

ACTIVITY		YT	UE	RT(A)	RT(C)	IN
35TFW (DOI), Da Nang		1	1	1	1	1
DC 7AF/13AF Thai (DI), Udorn		1	1	1	1	1
8TFW (DOI), Ubon		1	1	1	1	1
6300SG TUOC (DOI), Udorn		1	1	1	1	1
388TFW (DOI), Korat		1	1	1	1	1
366TFW (DOI), Phan Rang		1	0	0	0	0
355TFW (DOI), Takhli		1	1	1	1	1
12TFW (DOE), Cam Ranh Bay		1	0	0	0	0
1st Air Commando Sq Attn: TH Proj Off, Pleiku,	Tiger Hound Only	1	0	0	0	0
J2-JCS (ARVN)	(3)	0	1	1	1	0
TH Proj Off, DMR 16, Danang	Tiger Hound Only	5	0	0	0	0
TACC-TH	Tiger Hound Only	1	0	0	0	0
VNAF (DCS-INT)	(3)	0	1	1	1	0

NOTES: (1) One set stereo prints in addition to the select prints on BDA.

(2) If more than one target is covered on the select print/stereo pair (as applicable), additional print/stereo pair is required for each target covered.

(3) Stereo pair in addition to select print.

(4) Include MCT for each mission.

(5) BDA only.

APPENDIX I

USAF RECONNAISSANCE PROJECTS IN SEA

PROJECT	DESCRIPTION	DATE BEGUN	OPORD
ABLE MABLE	TSN (1st Don Muang) based RF-101 Photography	1961	PACAF OPORD 220-62
BANGO FLIGHT	RF-101 Support of F-105 Alert	1965	
BARREL ROLL	Recon & Strikes in NE Laos (Against PL/VM)	1964	7AF OPORD 433-66
BIG EAGLE	B-26K Night Armed Recon	1966	
BIG EYE	EC-121 Airborne Radar	1965	
BIG LOOK	USN Airborne Radar From DaNang		
BLACK SPOT	Two C-123 Weapons, Radar, FLIR, LLLTV	1967	
BLACK WATCH	RB-26 Night Recon of Laos	1962	
BLUE SPRINGS	C-130 Drone Recon		
BLUE TREE	Recon in NVN	1965	
BOX TOP	SAC RB-47	1965	
DARK EAGLE	Dev IR or SLR (Only All Weather Sensor)	1966	
DRILL PRESS	JC-47 Comm Intel	1966	2AD OPORD 434-66
FARM GATE	Air Commando With RB-26's	1961	
FIELD GOAL	RT-33 Recon From Don Muang	1961	12AF OPLAN 203-61
GAY BLADE	C-130E		5AF OPORD 500-66

PROJECT	DESCRIPTION	DATE BEGUN	OPORD
GREEK GOD	Early Name for MAD KING		
GREEN PYTHON	Udorn Based RF-101 Operation	1965	
HAWK EYE	Early RC-47 ARDF	1964	2AD OPORD 430-66
HILO HATTIE	Early IR Test	1962	62 PACAF OPORD 222-62
JADE KING	An Especially Sensitive Program	1965	
LONESOME TIGER	FLIR in B-26K Flight Test	Oct 1966	
LUCKY DRAGON	SAC U-2		
MAD KING	RB-57F Long-Range Oblique Photo	1965	
MILD WIND	RB-57F Long-Range Oblique Photo	Late 1965	PACAF OPORD 153-66
PATRICIA LYNN	RB-57E Visual Photography	1963	
PHYLLIS ANN	Advanced RC-47 ARDF	1966	
PROJECT 1553	Four A-1E LLLTV, SEA	Oct 1966	
QUEEN BEE	Early Name for SILVER DAWN		
RED HAZE	Infrared (IR) Photography		
SEAL TEST	Recon Survey of VC Shipping	1963	
SILVER DAWN	EC-130B	1965	5AF OPORD 500-66
SKY WAVE	RB-57F Long-Range Oblique	1965	
STEEL TIGER	Recon & Strike in Laotian Panhandle (Interdict VC)	1965	7AF OPORD 433-66
SWEET SUE	RB-26C	1964	

PROJECT	DESCRIPTION	DATE BEGUN	OPORD
TIGER HOUND	VR & Interdiction in Portion of Laotian Panhandle	1965	
TOY TIGER	Improved Low Altitude & Night Photo RF-101	1962	
TROJAN HORSE	U-2	1964	
WASHING WINDOW	Early Weather Recon in NVN	1965	
WILD WEASEL	F-100F to Back SAM Strikes	1965	2AD OPORD 425-65
YANKEE TEAM	Recon in Laos	1964	

(This page is UNCLASSIFIED)

FOOTNOTES

CHAPTER I

1. (S) Ltr, PACAF (PFLPO) to 13AF, 2AD, 35 Tac Gp, RAND Corp Visitors (Messrs Graham, Katz and Goure), 5 Aug 64. (Hereinafter cited as "RAND Corp Visitors".) Doc 1.

2. (S) Pipe Stem Detachment "Daily Historical Log", 18 Oct - 9 Nov 61, Doc 2; Also "RAND Corp Visitors" and Interview by author with Capt Gayle Coffman, 45RTF, 10 June 66.

3. (S) 2nd ADVON (Det 10) DO to Cmdr Det 10, "Report on Activities under PACAF OPORD 220-62," circa 5 March 62, Doc 3. Also (S) Hist 2 ADVON, Nov 61 - Oct 62; (S) Hist 13AF, 1962, p-62; (S) Hist 2 Air Div, 1964, Chap 2, p. 63; PACAF OPORD 220-62 ABLE MABLE, 15 Jan 62, 2 Air Div, Supplement 1, 7 Dec 62, Doc 4.

4. (C) PACAF SO G-85, 15 Nov 61.

5. (S) Hist 2 ADVON, Nov 61 - Oct 62.

6. PACAF SO P-75, 20 Nov 61.

7. (S) Chart, "Organization of USAF Units - SE Asia".

8. (S) Hist 13AF, 1962, p. 62.

9. Interview by author with Capt Raymond Tiffault.

10. (TS) Project CHECO SEA Report, Part V, "Air Operations Oct 61 - Dec 63," May 1964.

11. (S) "RAND Corp Visitors".

12. (S) Hist 13AF, 1962, p. 62.

13. (S) Hist 13AF, Jul-Dec 63, p. 79.

14. (S) Det 2 ALPHA (4400 CTS), Briefing Paper, Circa 13 Apr 62.

15. (S) Hist 2 ADVON, Nov 61 - Oct 62, p. 160.

16. (S) Hist 13AF, 1962, p. 63.

17. (S) Msg 13AF 1300T-W/2/1446A, to PACAF Info 2ADVON, 18 May 62;

Msg 13AF 1300X/2/5022/A, to 2nd ADVON, Info PACAF, 21 May 62. Sup Docs 238 and 239 to Hist 2 ADVON, Nov 61 - Oct 62.

18. (S) Hist 13AF, 1962, p. 63.

19. (S) Hist 13AF, Jan - June 63, p. 73; Hist Det 1, 33 Tac Gp, July - Dec 63, Doc 9.

20. (S) Hist 2 ADVON, Nov 61 - Oct 62, p. 161; (S) Msg PACAF PFDOP 62-1526-F to 2nd ADVON, 21 Jan 62.

21. (S) Hist 2 Air Division, Jan - June 64, p. 111.

22. Ibid.

23. PACAF SO G-26, 17 Apr 63.

24. (C) "A Salute to the 13RTS", 7AF Weekly Air Intelligence Summary, Vol II, No. 23, 11 June 66; "Story of the 13th RTS", 7AF Weekly Air Intelligence Summary, Vol II, No. 20, 21 May 66, pp. 1-3; (C) Following histories of 13RTS: Jan - June 64, Doc 5; July - Dec 64, Doc 6; Jan - Jul 65, Doc 7; Jul - Dec 65, Doc 8.

25. (S) 7AF CHECO Report 038, "History of the 2nd Air Division, 1961-1963", 3 Jan 64.

26. Compiled from various sources.

27. (S) Hist 13AF, Jul - Dec 63, p. 80.

28. PACAF SO G-44, 3 Jul 63.

29. (S) Hist Det 1, 33 Tac Gp, Jul - Dec 63, Doc 9.

30. Compiled from following (S) Histories of Det 1, 33 Tac Gp: Jul - Dec, Doc 9; Jan - June 64, Doc 10; July - Dec 64, Doc 11; Jan - July 65, Doc 12. For additional breakdown see page 15, which is based on the above plus (S) Hist, Det 1, 6250 CSG, Jul - Dec 65, Doc 13.

31. Ltr, PACAF (PFOCO-R) to Concerned Agencies, "Report of Reconnaissance Survey, Southeast Asia," 2 Nov 63.

32. (S) Hist 13AF, Jul - Dec 63, P. 87.

33. (C) Ltr, Maj Gen Rollin H. Anthis, Cmdr 2AD, to Gen Jacob E. Smart, Cmdr PACAF, 25 Nov 63, as quoted in Hist 2AD, Jan - Jun 64, Chap I, pp 113-114.

34. Ibid.

35. (S) Hist 2AD, Jan - Jun 64, Chap II, p. 61.

36. Ibid.

37. (S) Hist Det 1, 33 Tac Gp, Jan - Jun 64, Doc 10.

38. Ibid.

39. Ibid.

40. (S) Hist 2AD, Jan - Jun 64, Chap I, p. 112.

41. (S) Hist Det 1, 33 Tac Gp, Jan - Jun 64, Doc 10.

42. (TS) Msg, JCS to CINCPAC, 181742Z May 64. The basis for the discussion of YANKEE TEAM is (TS) PACAF (Tac Eval Center), Project CHECO SEA Report "YANKEE TEAM", 8 Mar 66 (hereinafter cited as "YANKEE TEAM"); (S) Hist 2AD, Jan - Jun 64, Chap II, pp 63-66; and (TS) PACAF (DOPE) Project CHECO SEA Report "Escalation of the War in SEA July - Dec 64," n.d. (hereinafter cited as "Escalation of the War").

43. (TS) JCS to CINCPAC, JCS 2215, 181742Z 18 May 64 in "Escalation of the War," p. 149.

44. "Escalation of the War," p. 151.

45. (TS) CINCPAC to CINCPACFLT, 080009Z, July 64. The 10,000 foot limit was in (TS) JCS to CINCPAC, JCS 002665, 211924Z Nov 64. Both quoted in "Escalation of the War," p. 154 and p. 162. The removal of the 10,000 foot limit was Msg, JCS 009048, 141830Z Apr 65, quoted in (TS) Hq USAF (XOP), "Analysis of Air Operations SEA," Vol II, 12 Apr 65, p. 1-1.

46. "Escalation of the War," p. 162.

47. Interview with Major Simon Moses, "45RTF Commander, 19 July 66, and (S) Debriefing Report of Major John Kerwin (Chief, Recon Div, Deputy for Ops Plans and Requirements Directorate), 9 Apr 66, Doc 14. (Hereinafter cited as "Kerwin".)

48. "Escalation of the War," p. 164.

49. "YANKEE TEAM" p. 34.

50. (TS) PACAF (Tac Eval Center), "Summary Air Operations SEA," XIV, 24 Dec - 6 Jan 66. 1965 totals are as of 6 Jan 66. See 1966 Vols for 66 data.

51. "Escalation of the War," p. 159.

52. "Escalation of the War," p. 165.

53. (S) Hist 2AD, Jan - Jun 64, Chap II, p. 66.

54. (TS) Hq USAF (AFXOPLC), "Analysis of Air Operations SEA," Vol I, 6 Apr 65, p. 2-2.

55. Ibid. p. 2-3.

56. Ibid. p. 2-10a.

57. PACAF Project CHECO SEA Report, "Tiger Hound".

FOOTNOTES

Chapter II

1. (TS) PACAF (DOPE), Project CHECO SEA Report, "Escalation of the War in SEA, July - Dec 1964," n.d. pp 113-117. (Hereinafter cited as "Escalation of the War".)

2. "Escalation of the War," pp 117-119.

3. "Escalation of the War," p. 121.

4. "Escalation of the War," Chap III, "Preparation for Air Strikes on North Vietnam".

5. (TS) Msg, CINCPAC to CINCPACFLT, 070056Z, Feb 65. The attacks against the North are discussed in (TS) Hq PACAF (Tac Eval Center) Project CHECO SEA Report, "Rolling Thunder, Mar - Jun 65," 28 Mar 66. (Hereinafter cited as "Rolling Thunder".)

6. "Rolling Thunder".

7. (TS) Hq USAF (AFXOPLC), "Analysis of Air Operations SEA," Vol I, 6 Apr 65, p. 3-9. (Hereinafter cited as "Analysis of Air Ops".)

8. (TS) JCS to CINCPAC, JCS 20273, 022259Z Apr 65. Report in "Analysis of Air Ops".

9. (TS) PACAF (Tac Eval Center), "Summary Air Operations SEA", Vol XIV, 24 Dec 65 - 6 Jan 66, p. 6-5, and Vols XV to XXII 7 Jan - 31 May 66. (Hereinafter cited as "Summary Air Ops".) Beginning in Feb 66 recon in support of ROLLING THUNDER (& IRON HAND) was reported under BLUE TREE.

10. "Rolling Thunder,", p. 22.

11. (S) Msg, CINCPACAF to 5AF, VC 00082, 200019Z Jan 64; (TS) Msg, CINCPACAF to 5AF VC 50017, 200725Z Jan 65, cited in "YANKEE TEAM," p. 35.

12. (S) Debriefing Report of Major John Kerwin, (Chief Recon Div, Deputy for Ops Plans and Requirements Directorate), 9 Apr 66. Doc 14. (Hereinafter cited as "Kerwin".)

13. (C) Hist 20TRS, Nov - Dec 65, p. 1, Doc 15.

14. "Kerwin".

15. Interview by author with Brigadier General James R. Murphy, Deputy Commander 7-13AF, 28 Jun 66.

16. (S) CINCPACAF to 2AD, DO 31668, "RF-101 Relocation," 0013Z 3 Oct 65.

17. (S) CINCPACAF to 2AD, DO 30664, 1911Z 31 Jan 66; (S) CINCPACAF to CSAF, DPLMG 55396, 2349Z, 9 Apr 66, Doc 16; PACAF Movement Order 10, 27 Jun 66, Doc 17.

18. (C) JCS to CINCPAC, JCS 9504, 2226Z 27 Apr 66, Doc 18. (C) AMEMBASSY Bangkok to SECSTATE 2343Z 7 Apr 66, Doc 19.

19. PACAF SO G-81, 10 June 64.

20. (C) 7AF "Story of the 13th RTS," 7AF Weekly Air Intelligence Summary, Vol II, No. 20, 21 May 66, p. 3.

21. Interview by author with Major Paul E. Gergeron, Cmdr, Det 1, 13RTS, 1 July 66.

22. (U) Quoted in John Dille, "A Brand New Type of Air War in Vietnam," Life. Asia edition, July 11, 1966, p. 17.

23. "Summary Air Ops," Vol II, 9-22 July 65.

24. "Kerwin," pp 1-2.

25. (S) CINCPACAF to CINCPAC, DOP 54045, 0627Z 22 Mar 66, Doc 20.

26. PACAF Project CHECO SEA Report, "The New Division of Airpower in SEA," in preparation; also (TS) HistMACV, 1965.

27. "Kerwin," p. 2.

28. Ibid.

29. (S) USAFE to 17AF et al, OPRC 0870, 1749Z 29 Apr 66, Doc 21; (C) CINCPACAF to 7AF, DPL 54172, 2200Z 30 Apr 66, Doc 22; PACAF SO G-154, 12 May 66, Doc 23.

30. Interview by author with Capt Paul H. Greisen, DOCOEE, 7AF, 22 Jun 66.

31. "Summary Air Ops," Vol II, 9-22 July 66.

32. "Summary Air Ops," Vols XV to XXII.

33. (S) 460 TRW (DI), Briefing Board.

34. Interview by author with Capt Paul Greisen, 22 Jun 66.

35. (TS) Msg, CINCPAC to JCS, 0016Z 21 Mar 65, cited in "Rolling Thunder," p. 71.

36. "Summary Air Ops," Vol II, 9022 July 65. p. 4-3. The "Summary Air Ops," contains a tab which provides a summary of BIG EYE operations for the period of the report.

37. "Summary Air Ops," Vols covering 19 Aug - 14 Oct 65.

38. Interview by author with 1/Lt K. O. Pitchford, 13RTS, 6 July 1966.

39. (TS) CINCPACAF to 13AF, DOP 0243, "SKY WAVE" 14 Dec 65. Also (TS) 13AF DOP 30243, "SKY WAVE," 0400Z 14 Dec 65.

40. "Summary Air Ops," Vols XV and XVI.

41. (TS) CINCPACAF DOP 30053, "SKY WAVE," 4 Feb 66.

42. (TS) "Summary Air Ops," Vol II, 9-22 Jul 65.

43. Interview by author with Major Wesley G. Blain, 7th AF (TACC, Recon Branch, 25 Jun 66; (S) Hist 20TRS, Nov - Dec 65.

44. 2AD OPORD 425-65, 4 Nov 65.

45. (S) 2AD DO 05645, 0848Z, 26 Dec 65.

46. "Kerwin," p. 2.

47. (C) CINCPACAF to 7AF, GPL 54277, 2115Z, 7 Jun 66, Doc 24; (C) CINCSTRIKE to CSAF, STRIKE 4578, "SEABU Frag Order Nr 271 to CINCSTRIKE OPORD 543-P, 47 Buck," 1616Z 4 June 66. Doc 25; TAC MO 20, 3 June 66, Doc 26; PACAF SO G-193, 20 June 66. Interview by author with Major Jere Cresse, 7AF (DPLP-RC), 30 Jul 66.

48. (S) USAFE to 26TRW, PPO 071U 00149, "Deployment of Units," 1410Z, 12 May 66, Doc 27.

49. Ibid. An excellent summary of all Phase II moves (other A/C besides RF-4C's) is (S) CINCPACAF to 7AF, DPL 54141, "SEA Deployments," 0210Z 15 Apr 66, Doc 28, which quotes CSAF msg AFOAPDB 82411, 1921Z, 12 Apr 66. Also see (S) Ltr, 2AD, DOPR-P "PACAF Force Deployments" 21 Oct 65, Doc 29.

50. (TS) Joint Research and Test Agency (JRATA), Recon Study, ca. October 1965, Appendix C is extracted from this study.

51. "Kerwin," p. 8 and "Summary Air Ops," Vol IV, 6-19 Aug 65, p. 8-E-1.

52. "Summary Air Ops," Vol XV, 7-20 Jan 66.

53. "Summary Air Ops," Vol XL, 12-25 Nov 65, p. 6-4.

54. Ibid.

55. "Summary Air Ops," Vol IV, 6-19 Aug pp. 8-E-1 to 8-E-4.

56. (C) Memo, 13RTS, "Infrared Reconnaissance," 5 Jun 65, Doc 30.

57. "Summary Air Ops," Vol IV, p. 8-E-2.

58. (C) Intelligence Report, FVS-12, 632, Doc 31.

59. Interview by author with 1/Lt Harold S. Pyper, IR Section, 13RTS, 7 July 66.

60. (C) Ltr, 11 DASC to 2AD (DI), "II Corps Red Haze Support," 10 Jan 66, Doc 32.

61. (C) Ltr, EMIRC to AFSC (SCSR), "Ir Recon," 10 May 66.

62. 2AD, DOPR-RC 05252, "Infrared Recon in SEA," 6 Dec 65.

63. CINCPACAF DO 32297, "PATRICIA LYNN Configuration," 10 Dec 65, see also (S) CSAF AFRDRE 94723, 9 Mar 66.

64. "Operation DARK EAGLE," 7AF Weekly Intelligence Summary, Vol II, No. 20, 21 May 66, p. 37.

65. Interview by author with Lt Col H. W. Trimble, Hq 7AF (DOPR), 14 - 15 July 66; 2AD OPORD 430-66, 24 Nov 65.

66. (C) MACV MACJ21 01788, "ARDF Requirements," 0210Z 19 Jan 66.

67. PACAF to 7AF, DOCPD Telecon 198, 12 Feb 66. Interview with Lt Col H. W. Trimble.

68. CSAF AFSME 93197, "TAC/DO (7) Project PHYLLIS ANN," 1 Mar 66.

69. (C) CSAF to USCINCMEAFSA, JCS 6713, "Deployment of Air Force Units to SVN," 1424Z, 23 Mar 66, Doc 33.

70. (S) 7AF (DO), "Recent, Approved & Proposed Actions & Special Notes," 27 Apr 66, Doc 34; PACAF SO G-102, 6 Apr 66.

71. Ibid.

72. Ibid.

73. Interview by author with Major J. Cresse, Recon Div, Plans and Requirements, DCS/Plans & Ops, 7AF, 10 July 66.

74. 2AD OPORD 434-66, 31 Dec 65.

75. "PACAF Intelligence Plan, 1966-67," DIO 66-05119.

76. (TS) 5AF OPORD 500-66 (GAY BLADE); (TS) 2AD OPORD 503-66, 28 Nov 65. This provides for escort.

77. (TS) 2AD OPORD 503-66, 28 Nov 65.

78. (S) PACAF to 2AD, DOP 51001, "Recon Organization, SEASIA," 0453Z, 5 Jan 66.

79. (U) PACAF SO G-41, 15 Feb 66, Doc 35.

80. Ibid.

81. Interview by author with Col Edward H. Taylor, Commander, 460 TRW, 15 June 66.

82. (S) Hist, 15TRS, July - Dec 65.

83. "Summary Air Ops," Vol XIV, 24 Dec 65 - 6 Jan 66, p. 6-2.

FOOTNOTES

Chapter III

1. "Summary Air Ops," Vol XIII, 10-23 Dec 65, p. 9-A-1.
2. "Summary Air Ops," Vol XXII, May 66.
3. Ibid.
4. From 13RTS and Det 1, 13RTS, production charts.
5. Ltr, 7AF (DIM) to 13RTS and Det 1, 13RTS, "7AF Photo Production/ Distribution Instructions," 16 Jun 66. Changes as of 27 Jul 66. Doc 36.
6. "Summary Air Ops," Vol XIII, 10-23 Dec 65, p. 9-A-3.
7. (TS) Tri-Command Conference Book, 8-9 Feb 66, Langley AFB, Va., p. H-36.
8. (S) Thomas Wasilenski and Vincent M. Everding, "Planning and Control of Air-Ground Operations in SVN," Ops Analysis Div, Hq 2AD, Tech Memo #4, 1 Jun 65, p. 17.
9. "Kerwin," p. 10.
10. (TS) Minutes, PACAF Commanders' Conference, Nov 65, DM-TSC-5451, p. 85.
11. SEAOR 45-FY-66, 3 Apr 66, Validated by PACAF 12 Apr 66.
12. Interview by author with Lt Col H. W. Trimble, Hq 7AF (DOPR), 14-15 July 1966.

~~TOP SECRET~~
NOFORN
AIR FORCE EYES ONLY

PROJECT CHECO
Contemporary Historical Evaluation of Combat Operations
REPORT

ANNEX TO

USAF RECONNAISSANCE IN SOUTHEAST ASIA (1961-66)

25 OCTOBER 1966

HQ PACAF

Directorate, Tactical Evaluation
CHECO Division

~~TOP SECRET~~
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ANNEX TO USAF RECONNAISSANCE IN SEA 1961-1966

Reference	Comment
p 55, 2nd para.	In January 1966, MACV stated a requirement for an additional 1256 hours of ARDF per week. The coordination draft of the letter, initially, included the statement: 1/

" It does not appear that the C-47 will meet this requirement in a timely manner."

Lt General Joseph H. Moore, Commander, 2AD, in a telephone call to J-2 MACV had the sentence deleted.

Brigadier General George B. Simler, 2AD Deputy for Operations in an "Air Force Eyes Only" message 2/ to Major General John W. Vogt, PACAF DCS Plans and Operations, quoted a MACV message which had originally stated (in draft) that "79 U5/U8 (Army light aircraft) equivalents" were required; 2AD had withheld coordination until the words were changed to "1256 hours of ARDF coverage" (per week), i.e. no particular aircraft was named for ARDF. General Moore had stated in December, when requesting additional C-47's, that: 3/

"Limitations of short range Army aircraft and lack of all-weather capability of aircraft and crews, point up the need for USAF to enter this special area of aerial reconnaissance as a proper role for USAF."

The Air Staff stated that "Airborne RDF is an Air Force mission and all possible action will be taken to keep it so."[4/] PACOM seemed about to accept MACV's position and request only U6/U8 aircraft, when an Air Froce briefing of CINCPAC stressed the advantages of the improved C-47 program.[5/]

The Army aircraft used aural null techniques which required the plane to fly a pattern (which might reveal its mission) and that transmission be sustained. The C-47 ARDF program used Phase Angle Discrimination (PAD) which took angle measurements automatically in less than one second without requiring human judgment. PHYLLIS ANN, the improved C-47 program, included side-calibration so that fixes could be gotten in any direction without turning the aircraft. Thus, the mission was not compromised and the "quick shutdown transmitter could be caught.

ANNEX TO USAF RECONNAISSANCE IN SEA 1961-1966

FOOTNOTES

1/ (C) MACV, MACJ21 01788, "ARDF Requirements," 0210Z 19 Jan 66.

2/ (S) Msg, AF Eyes Only, Gen Simler to Gen Vogt, DO 04476, "MACV Aircraft Requirement for ARDF," 24 Jan 66.

3/ (S) 2AD to PACAF, Gen Moore to Gen Harris, VC 00002, "ARDF," 31 Dec 65.

4/ (S) CSAF to 7AF, AFCVC 87242, "Airborne Radio Direction Finding," 1716Z, 29 Jan 66

5/ PACAF to 7AF, DOCPD Telecon 198, 12 Feb 66. Interview with Lt Col H.W. Trimble.