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USAF LOGISTIC PLANS AND POLICIES

IN

SOUTHEAST ASIA

1965

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by

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FOREWORD

USAF Logistic Plans and Policies in Southeast Asia, 1965 is the latest of a series of studies prepared by the USAF Historical Division Liaison Office on the current war. Previous published histories include: USAF Plans and Policies in South Vietnam, 1961-1963; USAF Plans and Policies in South Vietnam and Laos, 1964; and USAF Plans and Operations in Southeast Asia, 1965.

This study briefly reviews the status of the USAF logistic system prior to the 1965 buildup of American forces in Southeast Asia and the steps taken by the Air Force to support them. Separate chapters cover the construction of new air bases in the theater, plans relating to conventional war munitions stockage, and efforts to obtain an adequate fuel supply system. Appendices also have been provided on aircraft readiness rates and the ordnance inventory.

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I. ANATOMY OF USAF LOGISTICS

(U) Despite the best intelligence and imagination, prognoses of the character and possible development of future wars have usually proved to be far wide of the mark. This has not been surprising. Given the limits of human resources and the prankishness of history, it would indeed have been remarkable if the opposite had been the case. For the nature of war has not only been dictated by technology, but also by politics and chance.

(U) The situation which developed in Southeast Asia (SEA) during the early 1960's provides the latest example of history's refusal to follow scripts prepared for it by governments or planners. After a prolonged effort by the Communist regime in North Vietnam to subvert and destroy the independence of the Republic of Vietnam (RVN), and a similarly lengthy, low-keyed attempt by the United States to preserve the latter, in 1965 both parties found themselves deeply engaged in an undeclared war. It proved to be a modern yet guerrilla conflict, but above all a war in which military objectives were bent to fit political goals to an unparalleled extent. Comparison with the Korean War remained valid, but there were significant differences.

(U) Korea was formally at least a United Nations action and a conventional limited war. In Vietnam, although the United States and its allies were not bound by U.N. restrictions, they fought a war in which self-imposed restraints, designed so as not to precipitate a wider war, became a paramount feature of hostilities. Because of these restraints; because of political instability in the South Vietnamese government; because Vietnam was a counterinsurgency in which the loyalty of the indigenous population to the Saigon government remained the key element; because

of these factors and more, the war in Vietnam to which the United States committed its honor and resources was a political, economic, and social war without parallel in its history.

(U) Thus, the essential nature of the Southeast Asia war became very important to the basic conduct of hostilities. And the shape of conflict dictated the kind and numbers of forces the U.S. committed; it dictated the configuration and quantity of weapons; it dictated the character of organization; and, to a degree, it molded the logistical response. To say that the U.S. was better prepared for Vietnam than for Korea was still to observe that preparations were neither complete nor adequate.* It would have been remarkable if the opposite were true.

The Logistical Legacy

(U) Logistics is one aspect of war and an exceedingly vital one. Its basic purpose is to provide combat ready forces with adequate equipment and supplies to execute operational plans as directed. Lt. Gen. Thomas P. Gerrity, USAF Deputy Chief of Staff, Systems and Logistics, defined the activity in the following terms:[1]

> By logistics, I mean the science of planning and carrying out the acquisition, distribution, maintenance and disposal of weapons and support equipment, the movement and support of military forces, and the acquisition or furnishing of services. More simply stated, logistics is the link between American industry and the American fighting man. It is deeply involved with both.

([redacted]) How successful, in general, was the U.S. counterinsurgency response and, in particular, how successful was the USAF logistical system supporting the air war 8,000 miles from the Pacific coast? Overall, it may be said the system performed creditably during 1965 when one considers the very rapid buildup that took place. The major logistical theme during 1965 was the intensive effort to catch

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* See Jacob Van Staaveren, USAF Plans and Policies in South Vietnam, 1961-1963, (AFCHO, 1965).

up with the numbers of personnel and weapons being deployed to the theater. It should be recalled that early in the year the political and military position of the Republic of Vietnam had deteriorated to a point where its very survival was in jeopardy. The American decision to move quickly and measurably formed the backdrop for the evolving USAF response. Obviously, the nature, location, and timing of the Air Force effort presented difficulties. The USAF logistical system was not configured precisely to cope with a sudden, unanticipated acceleration of air operations for a large-scale counterinsurgency in a far away country. But by improvising, modifying, and adjusting its support complex, the Air Force proved its ability to do the job.[2]

(U) The USAF logistical network supporting Southeast Asia differed from the systems employed during World War II and the Korean War. It was neither the massive, cumbersome, jerry-built complex of the former nor the decentralized system used during the latter conflict. It should be noted that,although the Korean conflict started a trend toward logistical centralization under the Secretary of Defense, at the same time it resulted in USAF decentralization. Both within Headquarters USAF and the former Air Materiel Command (AMC), activities were separated and broken down functionally into maintenance, supply, and transporation. The basic USAF depot system in the Continental United States (CONUS) was expanded during the Korean War. The Far East Air Materiel Command (FEAMCOM) had jurisdiction over all USAF supply and maintenance in the theater. In July 1952, FEAMCOM was redesignated the Far East Air Logistic Force (FEALOGFOR). Logistical support for the Air Force in Korea exhibited serious inadequacies that affected operational weapon systems. The USAF system at that time was flawed by inadequate prewar budgets, long lead time, and unprogrammed activities. Yet, at the same time, the logistical network made progress and contributed importantly to the war effort.[3]

(U) Korea was a political and military turning point. Prior to the war, the military felt that time would be available to mobilize national resources in the event of hostilities. But the nuclear technological revolution, the war itself, and the existence of a constant military threat changed the entire military-political milieu. During the post-Korea years of the 1950's, the keynote became forces-in-being. The United States and the world entered the hydrogen age with jet aircraft and then long-range missiles capable of delivering thermonuclear warheads. No longer, it was thought, would time be available to mobilize after a war began.

(S) Following the Second World War and the Korean War, USAF logistics faced still a number of operational tests prior to the Vietnam hostilities. In addition to periodic Soviet challenges in Europe (Berlin), the Lebanon, Taiwan, and Cuban crises placed heavy demands on the logistical network.* It should be observed that, before Lebanon and Taiwan (1958), an Air Force Council decision of 24 September 1957 stated that both general or limited war could be supported by the general war forces and materiel in being. Both the Joint Chiefs of Staff (JCS) and the National Security Council (NSC) agreed with this USAF viewpoint. However, cargo and passenger airlift during the Lebanese operation caused confusion and severe bottlenecks at terminals. And during the Taiwan crisis, shipment of substantial materiel to the Far East resulted in a large backlog at Travis AFB, Calif. The pipeline time for F-100 and F-104 spares amounted to 19 days during the early part of the operation. The congestion was caused by unsatisfactory coordination and communication together with an overload of priority traffic. For three weeks during August and September 1958, the Military Air Transport Service (MATS)+

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* See Robert D. Little and Wilhelmine Burch, Air Operations in the Lebanon Crisis of 1958 (AFCHO, 1962) and Jacob Van Staaveren, Air Operations in the Taiwan Crisis of 1958 (AFCHO, 1962).

+ Renamed the Military Airlift Command (MAC) on 1 January 1966. The old designation will be used in this narrative.

was forced to establish an embargo on non-mandatory freight through Travis.[4]

([redacted]) These events led the Air Force to analyze support requirements for local wars. Although it reaffirmed its position that local wars could be supported by general war resources, the Air Force recognized the need to make adjustments. By March 1960, there had been some progress toward separating materiel resources into general and limited war categories. A special Headquarters USAF and major command study group, which investigated the problem, recommended that while aircraft and personnel for limited war would continue to be included in the general war structure, materiel should be pre-positioned separately to support the different conflicts that might arise. Gen. Curtis E. LeMay, USAF Vice Chief of Staff, on 11 April 1960 approved these recommendations. Thus, USAF commands received authority to stockpile materiel at or near what were thought would be key wartime locations in order to meet possible emergencies including limited war contingencies.[5]

([redacted]) Lebanon and Taiwan pointed inexorably to a requirement for an adequate reserve of iron (nonnuclear) bombs for conventional warfare. Following the Korean War, USAF emphasis had been on developing a superior nuclear force. Within the Air Force, and in American military circles in general, the feeling was strong that the U.S. should not become involved in another long term, limited, conventional conflict of the Korean type. In fact, in August 1956, a USAF policy statement had declared that "no requirement exists for technical development to advance the state of the art in conventional explosives and incendiary materiel...". Even following the Lebanon and Taiwan crises, the Air Force continued to dispose of World War II iron bombs, although it retained adequate stocks of new series* conventional explosives.[6]

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* Bombs developed prior to 1956.

USAF Logistical System

(U) During World War II the Army Air Forces and the armed services as a whole relied upon large stocks of materiel in forward areas. While this policy led to massive surpluses of many items, the overburdened system proved unable to provide for rapid resupply of critical equipment when needed. By the time of the Korean War, the USAF logistic pipelines and resupply channels had improved substantially but much remained to be accomplished, as was brought out forcefully by the Lebanon and Taiwan crises of 1958.

(U) By 1965, when the United States began sending large numbers of personnel and major fighting units to Vietnam, the USAF logistical network was in a much better position to respond to the crisis. Prior to the theater buildup, support was provided all USAF forces in Southeast Asia through Clark AB, Philippines. Although some materiel was prestocked in Thailand, the Geneva protocol of 1954 forbade the building of new bases or introducing new war goods into Vietnam and Laos. By mid-1965, however, it became clear that Clark could not provide supply support as effectively as required by rapidly escalating events. This was true despite the fact that the base stocked over 200,000 line items.* The pipeline interval from source to user had to be reduced and high priority needs filled more quickly.[7]

(U) Thereupon, the Air Force adopted several major logistic innovations and revisions to improve its theater supply system. During 1965, 16 new base supply and equipment management accounts were opened in South Vietnam and Thailand. Prior to 1965, Tan Son Nhut AB at Saigon had been the only major account in either country (see chart, next page). And it became clear at the close

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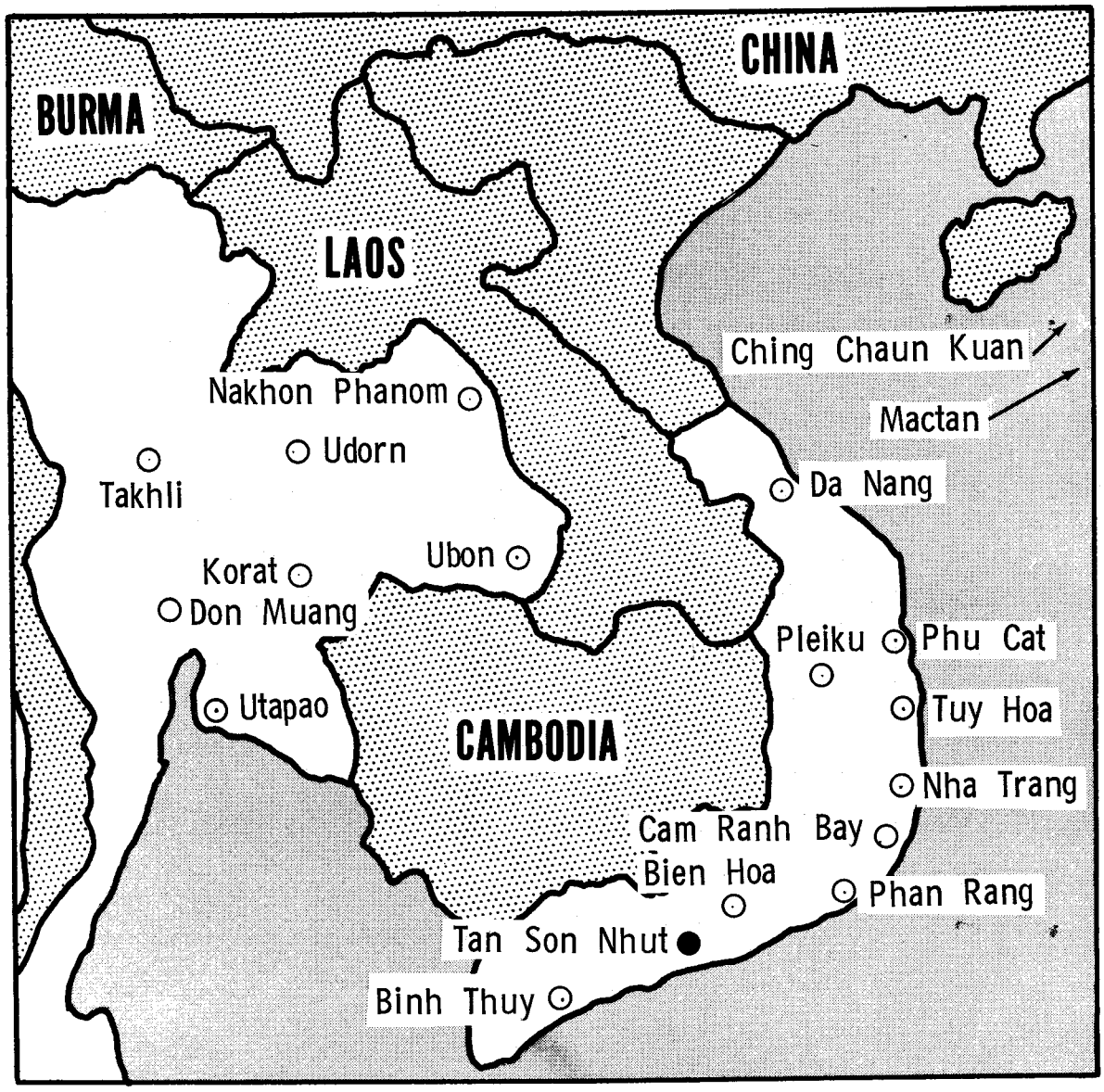
* Specific stock items, excepting munitions and medical supplies, but including aircraft, engine, vehicle and electronic spare parts.

SEA BASE SUPPLY BUILDUP



● JAN 65

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SOURCE AFSSS

of the year that additional accounts would become necessary in 1966. The Air Force planned to establish four additional bases to bring to 20 the number of base supply and equipment accounts in SEA, which would possess about 600,000 line items valued at approximately $200 million. Supply personnel at each of the bases in the theater requisitioned directly from one or more of the nine Air Materiel Area (AMA) depots in the United States which were under the Air Force Logistics Command (AFLC). Each AMA had responsibilities for equipping and maintaining specific USAF weapon systems. Requisitioned items were shipped directly to the theater from the depots rather than through Clark AB. Thus, the interval from source to user was reduced sharply from 30-60 days to 5-10 days for priority items.[8]

[redacted] Special procedures were established for high priority aircraft and direct support equipment. For example, the Speed Through Aerial Resupply (STAR) system (in operation prior to the SEA crisis) was refined to meet the increasing demands of the war. AFLC designated certain weapon system control points to receive critical requisitions by transceiver or electrical message directly from forward bases. Using STAR, the needed items were flown directly to the requester. In addition, special AMA points of contact were established to handle problems which could not be resolved under normal procedures. AFLC also organized a Logistics Activation Task Force (LATAF) to supervise all aspects of the buildup and insure that newly activated SEA bases possessed the materiel needed to support operational units.

[redacted] Beginning in April, AFLC dispatched Rapid Area Maintenance (RAM) teams to the theater to provide heavy maintenance support including removing and repairing damaged aircraft. The RAM teams made on-site repairs or prepared aircraft for movement to repair facilities. Similarly, Rapid Area Supply Support (RASS) teams helped process large quantities of materiel in the theater and expedited the dispatch of equipment to units at forward operating locations. RASS teams

were formed by the AMA's with the size and character of the teams dependent upon the kind of technical assistance required by the SEA units.[9]

([redacted]) The above organizational and procedural innovations -- which relied on modern airlift, sealift, and electronic communications -- all helped the Air Force cope with the crisis. When considered in light of the tremendous deployment during 1965 -- the number of USAF personnel in the theater tripled -- the fairly rapid response of the logistical organization and network was noteworthy.

Expanding the Production Base

([redacted]) During 1965 the amount of munitions expended by the Air Force rose sharply. From 7,954 tons consumed in Southeast Asia operations during 1964, tactical units of the Pacific Air Forces (PACAF) expended 116,417 tons in 1965. Monthly expenditures rose from 2,716 tons in January 1965 to 21,264 tons in December.[10] This rapid acceleration made mandatory the expansion of the production base while at the same time the Air Force accelerated greatly the output of existing production facilities. Beginning with the buildup in early 1965, the Air Force took measures to reopen conventional munition lines, especially for production of 250-, 500-, 750-, and 1,000-pound iron bombs. Too, fuzes were required in quantity and production lines were opened to turn them out and to produce 20 mm. ammunition and MK-24 flares.[11]

([redacted]) Delivery of required aircraft remained of paramount importance and, as losses due to attrition developed, the Air Force was forced, in essence, to shift from a peacetime to a wartime footing. The greatest need was for fighter and transport aircraft. At the outset of 1965, the F-4 was the sole tactical fighter in production and the new C-141 transport also was in production. The Air Force moved quickly to increase production of both. From a rate of 20 per month, F-4 production increased to 50 each month with the C-141 being accelerated from seven to nine per

month. The fiscal year 1965 supplemental appropriation of May 1965 included funds for procurement of additional F-4's as well as war consumable items and spares. The supplemental also authorized the Air Force to procure long lead time items including engines. For fiscal year 1966, 361 F-4's were ordered. On a calendar year basis, 287 F-4D's were on order for delivery in 1966 and 506 in 1967. The impact of the war had made entirely obsolete earlier USAF planning, which had called for 184 F-4's in 1966 and 148 in 1967.[12]

(S) In mid-1965 the Air Force initiated a number of studies to identify lead time for other aircraft under development, in production, or even out of production. Among these were the F-100, F-5,* OV-10, and A-7. The August 1965 budget amendment for fiscal year 1966 ($519 million) included $158 million for purchase of aircraft, munitions, vehicles, and other materiel. Both the May supplemental and the August amendment helped the Air Force make the transition to an in-being production base in some cases and to begin the long process of overcoming shortages. The expansion was designed to replace reserves and bring production up to, and eventually ahead of, the quickening consumption rate. The entire logistical process ran the gamut from updating old drawings and specifications for conventional munitions, bringing aircraft into production, and accelerating in-being production lines to soliciting former suppliers and identifying new sources for materiel and equipment.[13]

War Readiness Materiel (WRM)

(S) War Readiness Materiel were those supplies required to support the forces stipulated in the USAF Wartime Guidance (WG) document. The WRM

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* Later taken from Military Assistance Program (MAP) resources, modified, and directed for tests in Southeast Asia under the "Skoshi Tiger" program.

approach was designed to make certain that, in the event of war, an adequate amount of equipment would be available until production got under way and supply channels were stabilized. Over the years the span of time that WRM was expected to support USAF war plans fluctuated according to changes in overall strategy and planning.[14]

[redacted] For example, during the early 1950's the Air Force projected a large WRM requirement -- six or eight months of stock to support wartime expenditure rates. This heavy stockage, however, was considered too costly and, in its place, the Air Force shifted to a 90-day supply at wartime rates. Several years after the Korean fighting ended, WRM was further reduced to 60 days as the Air Force concentrated on planning for nuclear war and assumed that any hostilities would be comparatively short. The Lebanon and Taiwan crises of 1958, as noted earlier, led to a reappraisal of these plans. Some USAF officials were seriously concerned about not providing for conventional operations. Nevertheless, the Air Force continued to stress general war planning, although it took several tentative steps to shore up stocks for conventional war contingencies.[15]

[redacted] By 1960 the Air Force had adopted a support program of 180 days. With some exceptions, this remained the WRM policy up until the substantial USAF Southeast Asia buildup of 1965. The 180-day policy was based on the USAF Wartime Guidance document that translated short- and mid-range JCS directives* into specific guidance for the Air Staff and the major USAF commands. The WG included USAF Wartime Requirements (WR) which, in turn, delineated bases and locations for prepositioning materiel supporting a war projected within one year for USAF forces-in-being.[16] The Air Staff revised the WR document semiannually.

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* Including the Joint Intelligence Estimate, JCS Long-Range Strategic Study, Joint Strategic Objectives Plan, and the Joint Strategic Capabilities Plan.

[redacted] The Office of the Secretary of Defense (OSD) also provided guidance relating to WRM policy. The annual Secretary of Defense Logistics Guidance Letter, sent to all services, established general policy for basing requirements and acquisition of supplies and equipment. For example, in the summer of 1965 the Defense Secretary announced a general acquisition goal of 180 days support of nonnuclear action for 1,000 tactical aircraft operating at 21 sorties per aircraft per month. An annual USAF "Buy/Budget" letter complemented the OSD guidance and established more detailed wartime logistic objectives and policies. Previously, USAF WRM policy stipulated that 90 days of modern air munitions would be stocked overseas with 90 days backup in the United States for a total of 121,000 sorties (WRM objective). In late 1965 this policy was revised according to specific categories of munitions, i.e., a 180-day inventory for aircraft gun ammunition and 2.75-inch rocket launchers along with a 90-day inventory for air-to-ground missiles and other bomb series.[17]

[redacted] Among the most important WRM elements were those items referred to as war consumables, such as POL (Petroleum, Oil, and Lubricants), pylons and auxiliary fuel tanks, munitions, film, rations, and chaff. Other vital materiel were mobile spares and spare part kits (MOSPAKS)* and so-called "station sets." The latter equipment had to be in place at wartime bases prior to the arrival of combat units. Pre-positioned at planned locations, enroute bases, and at operating bases, the station sets were included in air transportable housekeeping equipment or "Gray Eagle" packages which were used in Southeast Asia to support deploying tactical units. War readiness spare kits (WRSK's) were also air transportable and comprised spare and repair parts for specific weapon systems for specified time periods pending resupply. Some of these kits supported vehicles and ground equipment in addition to aircraft.[18]

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* Once known as "flyaway kits."

([redacted]) The Gray Eagle housekeeping equipment and the station sets proved exceedingly important during the rapid deployment of fighter squadrons to so-called bare bases* in the theater. Pre-positioned at Clark AB, Philippines and other strategic locations in the Pacific, each Gray Eagle package was able to support a four-base complex of two or three tactical squadrons at each base. These packages could be assembled in about six hours and placed on transport aircraft in about 10 hours.+ Bare bases did not possess pre-positioned war consumables, which had to be brought in from stockpiles at the various oversea locations.[19]

([redacted]) USAF field experience with Gray Eagle packages (Swift Strike III, July-August 1963, the Carolinas, and Gold Fire I, October-November 1964 in Missouri) uncovered the fact that some of the equipment was difficult to erect, take down, and move. It also indicated that several additions to the package were needed including maintenance and supply shelters and a liquid oxygen production capability. During late 1965 the Tactical Air Command (TAC) -- in cooperation with AFLC -- initiated several actions to provide more and better equipment for the Gray Eagle package.[20]

([redacted]) Because adequate stores were not available in South Vietnam--indeed an entire new base complex had to be constructed--the SEA buildup called for rapid movement of supplies and creation of new pipelines. As great quantities of materiel flowed into the theater during 1965, the Air Force found, as has been noted, that Clark AB could not handle the large tonnages efficiently or adequately. It soon became apparent that the Air Force not only had to construct new logistical bases and airfields but also to reposition much equipment. Gen. J.P. McConnell, USAF Chief

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* A bare base was defined as an airfield with a runway and a water source.

+ The basic Gray Eagle package supported 4,400 personnel and comprised four 1,100-man kits. An airlift of 68 C-124 sorties was needed for each kit supporting 1,100 people.

of Staff, described the situation that evolved as "a major displacement or relocation" which resulted in temporary supply shortages. These included various categories of munitions, spares, generators, vehicles, and certain war consumables including fuel tanks, pylons, and adapters. Tanks and adapters were in especially short supply for the F-4 as was the 335-gallon tank for the F-100 and the 200-gallon tank for the F-104. Even as the Air Force took steps to reposition large stores to new locations, the sudden increase in consumption of materiel well beyond peacetime rates exacerbated this tight supply situation. As a consequence, much of the required supplies and equipment was not in place at the bases where needed, during early 1965.[21]

[redacted] Another shortage arose due to the inevitable time lag between use of critical materiel and establishment of new production and pipelines. Equipment which was not readily available in depot stocks and which could not be procured immediately was, in some cases, taken from major commands. In certain instances, assets in use were withdrawn from operational units outside the SEA theater. By the close of 1965, such items as bomblifts, bomb trailers, engine test stands, trucks, and air conditioners had been withdrawn from the United States Air Forces in Europe (USAFE) and other major commands.[22]

[redacted] In addition, the Air Force transferred several types of aircraft from the Air Force Reserve (AFRes) and Air National Guard (ANG) to Southeast Asia forces. Between January and September 1965, 20 B-57B/C's, 23 U-10A/B's, six C-123B's, and two HU-16's were taken from reserve and ANG units. Another 18 C-123's were withdrawn from reserve forces by the end of the year. The list of equipment shifted from the AFRes and ANG included trucks, buses, tractors, autos, forklifts, trailers, punching machines, lathes, and ambulances.[23]

Spares and Engines

[redacted] During 1965 the USAF spare parts inventory and procurement programs also were affected by events in Southeast Asia. Because the U.S. large-scale intervention had not been expected, normal USAF procurement proved unable to support actual air operations. The Air Force as a result was forced to draw upon its spares inventory to service the increasing numbers of aircraft in the theater. In 1962 the overall USAF spare parts inventory* had totalled approximately $10.5 billion. Under the impact of the war, it was expected to drop to about $7.6 billion by mid-1967 and not reverse this downward trend until 1968, when new production caught up with and overcame operational needs. In September 1965 AFLC listed a requirement for $333.2 million to procure the necessary spares to support 322 theater aircraft. By mid-1966 it expected funds totalling $518 million would be required to support 597 aircraft.[24]

[redacted] As far as engine spares were concerned, prior to 1960 the war readiness requirement had for all practical purposes been ignored. Subsequently, needs were based upon a wartime situation of 90 days assumed hostilities and a repair lead time of four-and-a-half months in the United States and seven months overseas. For the SEA contingency, USAF policy for general purpose forces called for an allowance of seven-tenths of an engine for every one failing or removed over a period of 30 days. This meant that during the first month, 30 percent of the engines removed had to be placed back into service. This policy was based on continuous base and depot engine rehabilitation. In other words, for the SEA theater during 1965, USAF policy was to remove engines after an arbitrary period had elapsed no matter how well they had been operating. Of course, the Air Force realized that, in the event of other worldwide contingencies, this policy would of necessity be suspended in favor of a "no-maximum" removal concept which would have the effect of extending engine life significantly.[25]

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* Including WRM and other stocks.

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Airlift and Seaborne Deliveries

([redacted]) As in other vital areas of logistics, airlift was subject to various adjustments during 1965 designed to intensify its operations to meet the demand for cargo carrying capacity. When it became clear in January that MATS resources would be fully committed (and that requirements would escalate), and as a backlog began to mount at Travis AFB, the JCS advised the services and all major commanders on 18 May that the following restrictions were being placed on the movement of cargo by air: (1) Priority would be given to channel* and special assignment airlift movement for Southeast Asia; (2) channel traffic was not to exceed total space available assignments in order to insure movement of Priority I channel cargo; (3) special assignment airlift would not be used for CONUS movement except in an emergency; (4) an express sealift would be established to Atlantic areas; and (5) commanders and services would make maximum use of surface shipping for unit movements.[26]

([redacted]) These restrictions had the desired effect of temporarily easing the aerial port backlog and in early June MATS requested the services to increase the flow of cargo into Travis since all military and commercial airlift was not being utilized. However, when the May restrictions were lifted, a new backlog promptly developed. Thus, on 1 July, the Air Force moved to alleviate the situation by restricting specific classes of non-critical materiel from air movement except in an emergency. An embargo also was placed on all transportation Priority II cargo on east coast channel traffic and the channel to Hickam AFB, Hawaii, with the exception of selected not operationally ready, supply (NORS) equipment and special requests from theater component commanders. On 19 July, the Joint Transportation

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* Normal point-to-point airlift.

[redacted]

Board (JTB) approved the USAF decisions, and added seven priority categories for special assignment airlift, which were implemented a day later.[27]

[redacted] The dearth of available airlift for regular or channel movement resulted from the increasing use of special assignment airlift by the Army, Navy, and Air Force. This situation continued despite the fact that the Air Force had limited special assignment cargo in March. As deficits in cargo airlift continued to mount, Secretary of Defense Robert S. McNamara on 21 August directed the following actions: (1) MATS C-130's and C-135's were to increase their flying hours from five to six hours per aircraft per day by October, and to eight hours by July 1966; (2) all MATS C-124 troop carrier units (except the squadron at Rhein-Main AB in Germany) would accelerate from 2.5 to three hours per day by October; (3) C-130E's of the Tactical Air Command would increase from 1.5 to three hours per day by October and then to five hours by July 1966 with C-130A's and B's going from 1.5 to 2.5 hours in October; (4) when phased in, C-141's would operate at a level of eight hours in lieu of the originally planned five hours; (5) production rate of C-141's would be raised from seven to nine per month and the total number procured would be increased by 19; and (6) the MATS commercial airlift authorization would be raised from the initial ceiling of $192.5 million in fiscal year 1966 to $250 million.[28]

[redacted] Despite the increased utilization rates, larger production, and use of commercial airlift along with various cargo aircraft modifications, the Air Force anticipated that airlift deficits would continue to mount as long as the buildup continued. The demands for airlift were readily apparent in the monthly tonnage shipped to the theater during 1965. In January the Air Force airlifted 4,183 tons of cargo and 11,486 passengers. In January 1966, this had grown to 13,506 tons of cargo and 43,325 passengers. Over 12,000 tons were moved in December 1965.[29]

[redacted] One of the most important contributions to USAF airlift was the introduction of the C-141 Starlifter into the operational inventory. The first C-141

squadron was activated in April 1965 and by February 1966 four squadrons were expected to be operational -- two at Travis and one each at Charleston and Dover AFB's. Under the pressure of expanding SEA operations, the Air Force put the C-141 to work when it was actually still in the test phase. The first flight from Travis to South Vietnam, on 5 August, took under 24 hours including refueling stops at Wake Island and Clark AB. Flying time was 18 hours and 15 minutes or about half the time required for the C-130E turbo-prop. The 49,000-pound payload was unloaded in 15 minutes using the 463L automated cargo handling system. Obviously, the Starlifter provided a dramatic increase in USAF airlift capability, although its real impact would not be felt until 1966.[30]

(S) The Air Force carried out 76 C-141 missions during December 1965 from the CONUS to the Far East -- including 6 to Japan, 4 to Okinawa, 14 to the Philippines, 20 to South Vietnam, and 32 supporting special SEA missions. A total of six squadrons was programmed to become operational by July 1966, increasing to 14 by the end of fiscal year 1968.[31]

(S) The demand for airlift was not the only channel problem faced during the year. Another was that Tan Son Nhut AB, the sole terminating point for MATS aircraft on the Travis-RVN channel route, became congested. In mid-1965 a 24-hour operation to unload MATS aircraft was initiated at Tan Son Nhut. Further, more aerial port terminal detachments were established in South Vietnam and Thailand to cope with airlift of in-country materiel. From 6 in May 1964, the number of terminal detachments increased to 18 by July 1965. Also, the Air Force poured in greater amounts of equipment designed specifically to handle the large amount of cargo flowing into the theater.[32]

Red Ball Express

(S) Directed by Defense Secretary McNamara in late November after a visit to Southeast Asia, Red Ball Express comprised at least one flight daily from

Travis AFB to South Vietnam in direct support of special Army requirements.* McNamara had become concerned over the amount of Army equipment deadlined in Vietnam for a lack of repair parts.+ He asked that one aircraft each day be held especially for critically required Army parts. The Secretary's plan was speedily implemented. Following receipt of the Secretary's instructions, the Air Staff advised MATS on 6 December and the first flight departed Travis on 8 December. Originally planned to move 35 tons monthly, Red Ball Express handled a great deal more during December 1965 and January 1966. Between 8 December -22 January, the Air Force moved 592 tons of Red Ball cargo, an average of 13.7 tons each day.[33]

SEA Express

([redacted] Another USAF approach to the SEA buildup was the Southeast Asia Express. A non-stop seaborne service direct to Saigon and Bangkok, Thailand, it was a direct outgrowth of the severe deficit in military cargo airlift. High priority requirements of the Air Force, Army, and Navy forced MATS not only to restrict shipments on a priority basis and to enlist a measurable amount of commercial airlift, but also to investigate the possibilities of sealift. Following a meeting of service transportation authorities and the Military Sea Transportation Service (MSTS), they decided to initiate non-stop ocean service direct to Saigon and Bangkok weekly from the Army's Oakland, Calif., terminal. These crossings were to be in addition to regular MSTS shipments and charter movement.[34]

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* Although one flight daily was specifically designated as a Red Ball flight, Army cargo was carried on more than one flight each day from the very beginning of the Red Ball project.

+ For example, 40 percent of the bulldozers and 40 percent of the two-and-a-half-ton trucks at Cam Ranh Bay were in NORS status.

([redacted]) After being approved by the JCS and OSD, the first SEA Express sailed on 9 April carrying 4,125 measurement tons of Army, Navy, and USAF cargo. Sailing time from Oakland to Saigon was about 20 days. An additional five days was required for delivery to Bangkok. Through most of 1965, the average load moved by SEA Express was approximately 10,000 tons per ship. This service included preferred cargo handling in overland transportation as well as at the Oakland terminal. When SEA Express proved effective, it was expanded in May to include shipments from the east coast in order to further alleviate pressure on airlift.[35]

Southeast Asia Operational Requirements

(U) A few months after the President's decision in April 1965 to intervene directly in Vietnam to prevent the Communist seizure of power, and as the military buildup proceeded, it became clear that a need existed for another rapid response to fill the requirements of USAF combat forces. The result, as it developed in early July, was establishment of a system known as Southeast Asia Operational Requirements (SEAOR's).

([redacted]) During 2-4 June the Air Staff convened a conference with representatives from PACAF, TAC, Air Force Systems Command (AFSC), AFLC, and the Military Assistance Command, Vietnam (MACV). The purpose was to review procedures designed to accelerate the Air Force response to operational requirements. On 6 July, as a result of the meeting, Gen. W.H. Blanchard, USAF Vice Chief of Staff, approved several measures for accelerating the requirements process, including improving organizational procedures. Specifically, he directed that AFSC and TAC open liaison offices in the 2d Air Division headquarters at Tan Son Nhut in order to expedite transmission and completion of SEA Qualitative Operational Requirements (QOR's) and Class V modifications. Henceforth, all SEA operational requirements were first to be identified by the 2d Air Division as numbered SEAOR's.[36]

[redacted] These proposed SEAOR's would be forwarded simultaneously to the 13th Air Force, PACAF, AFSC, Air Training Command (ATC), Headquarters USAF, and other cognizant commands. The Commander-in-Chief, Pacific Air Forces (CINCPACAF), would then analyze the SEAOR, tentatively approve or disapprove it, and transmit his decision to all affected agencies. If approved by CINCPACAF, AFSC's Aeronautical Division Office would direct establishment of a "best preliminary estimate" of costs, availability date, and technical solution of the problem. PACAF and TAC would then provide a judgment on the preliminary estimate. When all documentation was received, Headquarters USAF would either approve or disapprove the specific SEAOR and issue instructions to the commands.[37]

[redacted] Because SEAOR's were primarily directed to near-term solutions, they were expected normally to be completed in a year's time. Within a short time following issuance of General Blanchard's directive of 6 July, SEAOR's began coming in. Between July and December 1965, the 2d Air Division submitted 43 SEAOR's, of which 11 were completed including Class V modifications. Twelve of the 43 were cancelled by the end of the year and 20 remained in the process of development. Examples of completed SEAOR's included Class V modifications to the AC/DC system in the C-130, the co-pilot's window in the U-10B, and the CH-3C sand air separator. QOR's that were filled included such items as long range weather radar universal crash removal sling, and intrusion detection apparatus.[38]

Southeast Asia Logistic Requirements (SEALRS)

(U) The rationale for establishing a system of Southeast Asia Logistic Requirements (SEALRS) also rested on the guidance furnished by General Blanchard in his letter of 6 July 1965 which delineated the system of SEAOR's. Thus, while it became necessary to accelerate the operational requirements process because of

the significant buildup in Southeast Asia, it was mandatory that vital logistic requirements be processed speedily.

(S) Based on General Blanchard's guidance, Lt. Gen. Hewitt T. Wheless, USAF Assistant Vice Chief of Staff, on 19 July issued a specific directive formulating a priority system for dealing with urgent logistic requirements. He asked the major commands to identify vital logistic needs by categorizing them as "Project SEALRS." In this way, priority processing would be assured by the Air Staff and major supporting commands. When deemed appropriate, emergency action would be taken. General Wheless made it clear that only those requirements felt to be especially vital by the commander should be assigned to SEALRS.[39]

(S) General Wheless' guidance was meant to insure that ordinary administrative processes were circumvented by the SEALRS system. This included special channels for OSD approval or coordination. Both AFLC and AFSC were informed of the establishment of emergency procurement authority when warranted. The majority of SEALRS requirements following the July directives in fact dealt with procurement, particulary with much needed munitions. Updating kits for several types of equipment such as ECM (electronic countermeasure) pods were also procured under SEALRS. In general, these special logistic requirements were met through sole source procurement because of their priority nature.[40]

II. BUILDING THE SOUTHEAST ASIA AIR BASE COMPLEX

(C) The essential fact that governed the construction of the USAF air base complex in South Vietnam and Thailand was that the work was not under the complete control of the Air Force. Caught in a maelstrom of conflicting service and command demands and dependent for basic heavy contruction on the Army and Navy, which were simultaneously concerned with such competing projects as ports and ammunition depots, the Air Force found during the latter part of 1965 that work on the badly needed bases lagged far behind operational commitments. These commitments included "Rolling Thunder" strikes into North Vietnam, "Blue Tree" reconnaissance missions north of the 20th parallel, "Barrel Roll" and "Steel Tiger" strikes over Laos, "Yankee Team" reconnaissance over Laos, and "Iron Hand" missions against surface-to-air missile sites in North Vietnam.

(C) In July 1965 the Secretary of Defense, in accordance with a recommendation by Gen. William Westmoreland, Commander, U.S. Military Assistance Command, Vietnam (COMUSMACV), decided on a two-phased buildup of American forces in Southeast Asia. Phase I included deployments through 1965 with the second phase planned for 1966.* Scheduled USAF tactical force deployment was as follows:[1]

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* For background and details on phased deployments, see Jacob Van Staaveren, USAF Plans and Operations in Southeast Asia, 1965 (AFCHO, 1966), pp 45-63. The second phase for 1966 was actually divided into Phase II (January-June) and Phase IIA (July-December).

[redacted]

TACTICAL FIGHTER SQUADRONS

Deployed by December 1965

Vietnam

Bien Hoa	3 F-100
Tan Son Nhut	1 F-100
Cam Ranh Bay	3 F-4
Da Nang	1 F-4

Thailand

Takhli	3 F-105
Korat	2 F-105
Ubon	2 F-4

Scheduled for Deployment

Vietnam

Phan Rang	3 F-4
Bien Hoa	1 F-100

Thailand

Udorn	1 F-4

TACTICAL RECONNAISSANCE AIRCRAFT

Deployed by December 1965

Vietnam

Tan Son Nhut	12 RF-101
	18 RF-4C
	3 RB-66B
	4 RB-57E

Thailand

Udorn	12 RF-101
Takhli	9 RB-66C
	5 B-66B

Scheduled for Deployment

Thailand

Udorn	10 RF-4C

[redacted]

([redacted]) In addition, a Phase II A deployment plan was later adopted which would increase the number of fighter squadrons to be sent to Vietnam during 1966 to 10 with 6 additional squadrons to Thailand along with major tactical reconnaissance units. The dispatch of these forces obviously required major supporting bases with attendant equipment, munitions, and fuel.[2]

([redacted]) At the beginning of 1965, airfields in South Vietnam available to the Air Force were Bien Hoa, Binh Thuy, Da Nang, Nha Trang, Pleiku, and Tan Son Nhut. In Thailand, existing bases included Don Muang, Korat, Nakhon Phanom, Takhli, Ubon, and Udorn. The facilities at Tan Son Nhut, Bien Hoa, and Da Nang became particularly overcrowded with aircraft and materiel and developed into what were considered lucrative targets for the Viet Cong (VC).* With more tactical aircraft deployments forthcoming along with great tonnages of ordnance, fuel, spares, etc., dispersal became a necessity.[3]

([redacted]) Consequently, OSD decided to give top priority to the construction of two new Vietnam bases at Cam Ranh Bay and Phan Rang to be keyed to USAF Phase I deployments. In addition, during the year construction of a third base was authorized at Tuy Hoa, Vietnam, and another at Sattahip, Thailand. Secondary priority was given to improving existing bases by building additional parking aprons, parallel runways, primary power plants, and such support facilities as warehouses and ammunition, maintenance, and personnel buildings.[4]

([redacted]) The Air Force, as noted, did not determine the siting nor control the building of these facilities. The Army and Navy administered overseas military construction through the Army Corps of Engineers and the Navy Facilities Engineering Command. The sole element of the entire construction process retained under

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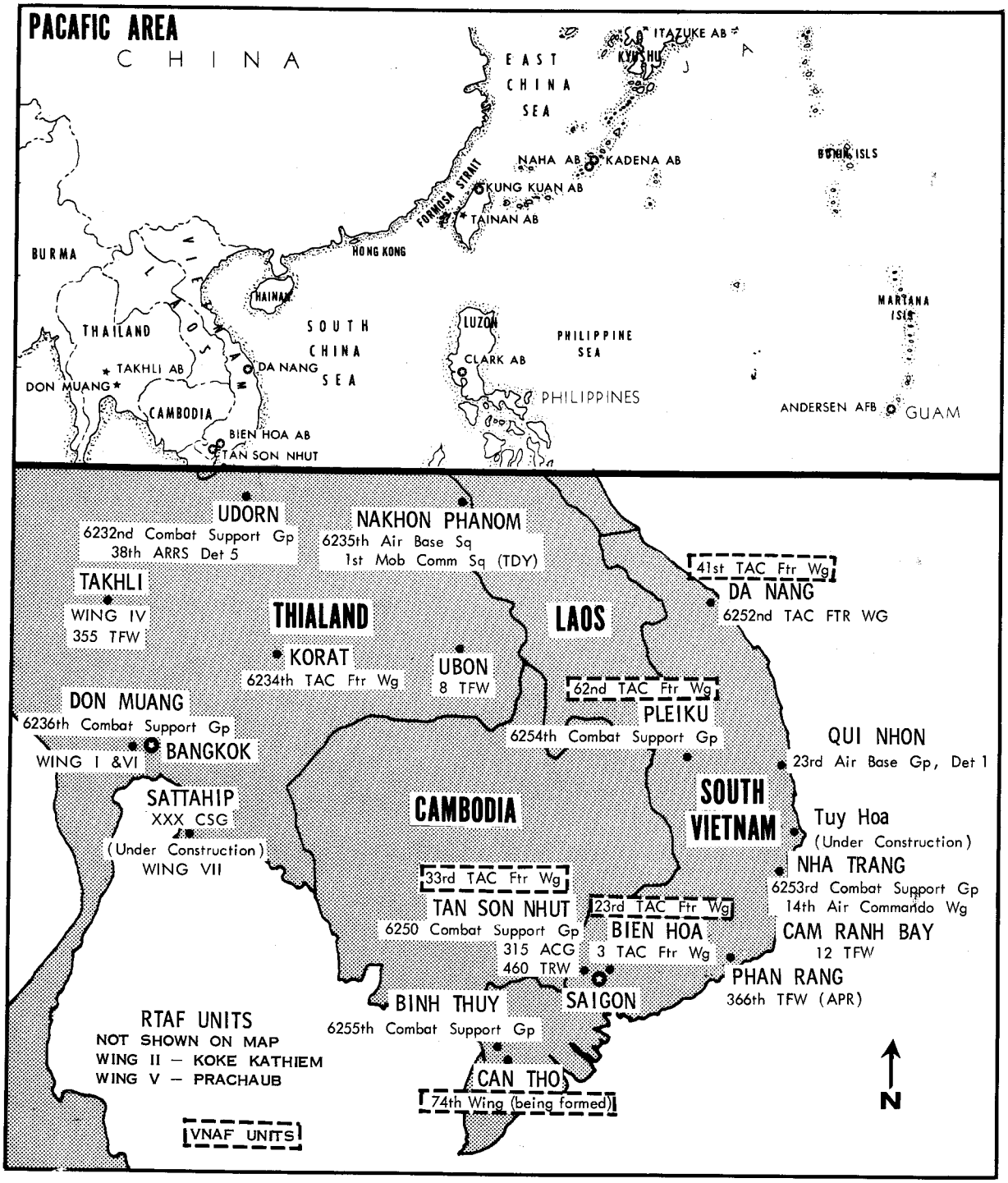
* For a discussion of Viet Cong attacks on U.S. bases and enemy terrorist activities, see Van Staaveren, 1965, pp 2-12.

[redacted]

UNIT DEPLOYMENT
SOUTHEAST ASIA



SOURCE: USAF Management Summary, Southeast Asia, 18 Feb 1966

[redacted]

USAF control was the initial statement of base requirements, including the criteria for the operational facility. Management and determination of siting, design, and construction rested with the Military Assistance Command, Vietnam, or its counterpart in Thailand.* Recommended projects were approved successively by the Commander-in-Chief, Pacific (CINCPAC), the JCS, and OSD.[5]

([redacted]) Specifically, the in-country commander, whether RVN or Thailand, was responsible for approving site locations and committing construction troops to the installation. Deployment of additional troop construction units was a JCS prerogative. The Army or Navy determined installation design and selected the civilian contractor firms which would do the work.[6]

([redacted]) It should be noted that airfield construction in Vietnam was initiated without any formal base rights agreement between the United States and the Saigon government. Although the legality of the building effort was traceable to a 1961 exchange of letters between President John F. Kennedy and President Ngo Dinh Diem of the Republic of Vietnam, the agreements for land base siting and construction were negotiated between MACV and the Vietnamese military. When changes occurred in the RVN military command or in the civilian governments, which were frequent, great uncertainties afflicted U.S. deployment planning. In the case of Thailand, the United States signed a formal military assistance agreement with the government, although here too specific arrangements more often than not were made by the military commands of the two nations.[7]

Army Support of USAF Construction

([redacted]) The most critical construction problem facing the Air Force was the difficulty of obtaining timely Army support for building the four new airfields.

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* The Military Assistance Command, Thailand (MACTHAI) was established on 10 July 1965.

During the early spring of 1965, with a significant deployment of tactical air units not only imminent but in progress, the Air Force moved to enlist Army support for its construction. On 8 April Maj. Gen. R.H. Curtin, USAF Director of Civil Engineering, discussed with the Army's Chief of the Corps of Engineers and the Navy's Chief of the Bureau of Yards and Docks, increased assistance for USAF activities in Southeast Asia. The Army agreed to support the USAF request.[8]

([redacted]) On 22 April General Blanchard formally asked Gen. Harold Johnson, Army Chief of Staff, to assign three engineer construction battalions to USAF projects in Southeast Asia. General Johnson's response was to advise the Air Force to adhere to command channels by directing PACAF to forward the precise requirement to the Joint Chiefs through CINCPAC for approval. The Air Staff thereupon directed PACAF to plan placing troop construction units in locations where civilian contract help was not available and where VC activity might be encountered. In May, acting upon this guidance, PACAF recommended to CINCPAC the deployment of two Army engineer battalions to Thailand (Korat and Ubon) and one to Vietnam (Phan Rang).[9]

([redacted]) The Army, however, felt that Korat and Ubon were better suited for civilian contractors. In June CINCPAC informed General McConnell that the Thai government was reluctant to have troop construction units in that country. He asked the USAF Chief of Staff to submit all requests for troop units through MACV or MACTHAI.[10]

([redacted]) The Air Staff was deeply disturbed as time continued to pass and no firm commitment came from the Army. Operational dates for the new base complex along with deployments had to be continually revised as a result. Since the Royal Thai Government would not welcome troop construction units, General McConnell directed CINCPACAF to concentrate on deployment of two Army heavy construction battalions to Vietnam. These would be used on the second (Phan Rang) and third

new USAF bases since the first at Cam Ranh Bay was being built by civilian contractors -- the RMK-BRJ consortium.* [11]

(U) Army support for USAF construction was to be provided in accordance with separate service regulations of January and February 1961 respectively, which were subsequently revised and incorporated into a joint regulation of 26 July 1965. This regulation stipulated that the Army would provide troop units for USAF requirements as determined jointly by USAF and Army component commanders of each unified command. Accordingly, "the Air Force component commander will state his phased requirements for construction and rehabilitation projects; the Army component commander will translate these into requirements for troop unit effort and materiel."[12]

([redacted]) As base beneficial occupancy dates (BOD) lagged, Secretary of the Air Force Eugene M. Zuckert on 9 July brought the problem to the attention of Secretary of the Army Stanley R. Resor. Noting that Army backing for USAF Southeast Asia construction was "still unresolved and this concerns me deeply," he reiterated the urgent need for engineer support. He indicated that negotiations through CINCPACAF-MACV-CINCPAC had resulted in prolonged delays and had been unsuccessful. If new airfields were to be built in order to support critically required tactical deployments, Army help was absolutely vital.[13]

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* Raymond International, New York; Morrison-Knudsen, Boise, Idaho; Brown and Root, Houston, Texas; and J.A. Jones, Charlotte, North Carolina. Principal partner was Morrison-Knudsen, International. During 1966, the RMK-BRJ work force would number almost 52,000 including 4,200 Americans, almost 42,000 Vietnamese and 5,700 Koreans and Filipinos.

[redacted] Secretary Resor replied that the Army had consistently and pointedly asked CINCPAC to insure the availability of sufficient manpower to support both services. And CINCPAC had in fact assured the Army that this was the case. According to Resor, the Army was currently deploying all units requested by CINCPAC as authorized by the JCS. At the same time, he declared that he had difficulty determining specific USAF requirements. It was absolutely necessary, he said, that the Air Force forward its construction requests to CINCPAC. Should the latter's reaction prove inadequate, then the Air Force should move to change it. The Army, he repeated, would support USAF needs.[14]

[redacted] Since PACAF had two months earlier recommended precise troop engineer deployments to CINCPAC, the Air Staff was understandably concerned. General Blanchard observed that Secretary Resor had deferred to MACV and CINCPAC; he asked the Air Staff to again contact CINCPAC through PACAF in order to have MACV comply with JCS requirements.*[15] On 24 July the Air Staff directed PACAF to forward to CINCPAC a priority list of construction needs designed to meet JCS-approved tactical deployments. Should this once again fail to produce results, PACAF was to advise the Chief of Staff so that he could take further action through JCS or Secretarial channels.[16]

[redacted] Finally, in August 1965, after CINCPAC had received the USAF priority request for two Army engineer construction battalions, the logjam broke.

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* Since the inception of MACV and MACTHAI, the Air Force had argued that their joint staffs did not possess adequate USAF representation. The USAF Chief of Staff had consistently recommended and supported plans aimed at providing a more equitable balance. (Hist (S), Dir/Plans, Jan-Dec 65, pp 338-340).

The Pacific commander assigned the 62nd battalion to Phan Rang, where it arrived in September, and the 46th to a planned third new airfield. However, movement of the 46th was held up because of the delay in selecting a location for the third base.*[17]

[redacted] In late November, after returning from Southeast Asia, Secretary of Defense McNamara directed the Air Force and Army to improve their joint planning for airfield construction. McNamara also felt that a great deal more analysis was needed on siting for--and building of--air bases for contingency operations. JCS contingency plans had not considered airfield construction. That there was a need for more precise planning was made clear by the fact that insufficient bases and lagging construction caused a delay of many weeks in the Phase I deployment of eight tactical fighter and three troop carrier squadrons.[18]

Site Selection

[redacted] The Air Force also found itself dependent on other agencies when it came to site selection. During the first six months of 1965 aerial and field surveys of potential airfield sites were conducted by the Navy's Officer in Charge of Construction (OICC). Locations examined included Phan Thiet, Hue Phu Bai, Phan Rang, Qui Nhon, Tuy Hoa, Phan Ri, and Cam Ranh Bay. In the case of Cam Ranh, the U.S. Ambassador to South Vietnam, Maxwell Taylor, as early as 1964 had suggested its development for military use. On the basis of architect-engineer analyses by the OICC, MACV finally selected Cam Ranh and Phan Rang as the sites for the first two new airfields. The former was also planned as a large naval and logistical base. In his endorsement, Ambassador Taylor urged the Defense Secretary to give high priority to construction of the Cam Ranh Bay complex.[19]

[redacted] In June, in response to McNamara's request that development proceed as rapidly as possible, Gen. Earle G. Wheeler, Chairman, JCS, advised that

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* Tuy Hoa was chosen in December and the 46th was rescheduled to be on location by February 1966.

[redacted]

MACV was preparing the necessary development plan. In the same month the Air Staff began drawing up its plans for constructing an expeditionary airfield at Cam Ranh Bay using AM-2 aluminum matting. After General McConnell requested and received JCS approval for procurement of 750,000 square feet of the material, McNamara approved purchase of AM-2 matting (in excess of 750,000 square feet) for Cam Ranh, Phan Rang, and also--for planning purposes--two additional expeditionary airfields.[20]

([redacted]) Although the originally scheduled operational date for Cam Ranh Bay was September 1965, construction did not get under way until August. Thereafter, through the concerted efforts of RMK-BRJ, Army troops, and USAF civil engineers, the 10,000-foot expeditionary runway was finished on 1 November. Two days later six F-4C aircraft landed on the strip. This first new base supported three tactical fighter squadrons with a parking area for two C-130 squadrons. With completion of the interim strip, the Air Force became concerned about possible delays in building the permanent 10,000-foot runway. Since the AM-2 matting would be subjected to extremely heavy use, the interim strip might well wear out before the contractor finished the permanent runway.[21]

([redacted]) At Phan Rang Army troops began earthwork on 25 October. A number of problems arose, however, and forced a slippage in the expected completion date from late 1965 to April 1966. Poor weather, a delay in delivery of AM-2 matting, an inadequate number of Army construction troops, and lack of a logistical base to support maintenance and operation of equipment were some of the factors contributing to the slippage. By the end of December the interim runway was about 10 percent complete.[22]

([redacted]) Meanwhile, feasibility studies were under way to select a third RVN site, either at Qui Nhon or Tuy Hoa. Following an OICC survey, MACV tentatively chose Qui Nhon but then reversed its decision after a more thorough

[redacted]

study.* Maj. Gen. Joseph H. Moore, 2d Air Division commander, urged selection of Tuy Hoa and, on 30 September, CINCPAC approved an architect-engineer survey of the site. Finally, in December, CINCPAC approved Tuy Hoa as the third airfield location.[23] Thus, although the JCS had originally programmed a 1 December operational date for Tuy Hoa in order to support critical Phase I deployments, by the end of the year no troops were at the site and the outlook for even a mid-April occupancy date was in doubt.[24]

([redacted]) Work on the fourth field, at Sattahip, Thailand, began on 25 October. The U.S. contractor was delayed in getting started by problems involving acquisition of real estate and also by lack of heavy equipment. The required operational date for Sattahip was April 1966, but again this date could not be met. Nor was there much likelihood in meeting the new date of July 1966. At the end of the year runway work was approximately two percent finished.[25]

([redacted]) In the meantime, the Air Force drew up plans to acquire a fourth airfield in Vietnam and a second in Thailand to complete the new six-base SEA network. Based upon a study in November, the Air Staff included these two additional bases in the proposed fiscal year 1966 supplemental request. By the end of December, McNamara had approved funding for the fourth base in the RVN and on 14 January 1966--after approving a new Thai base--Deputy Secretary of Defense Cyrus R. Vance proposed that the Thai site be selected by 31 January and the RVN location by 10 February. The Air Force hoped the new fields could become operational by the close of 1966.[26]

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* CINCPAC had supported Tuy Hoa but Gen. Westmoreland had argued for Qui Nhon because of shallow water which might degrade over-the-beach operations. Although Qui Nhon and Tuy Hoa were both operationally desirable, a great deal of sand would have to be moved at Qui Nhon for AM-2 matting. Soil preparation at Qui Nhon would have required 14 engineer construction battalion months. Also, labor was readily available at Tuy Hoa which was not the case at Qui Nhon.

([redacted]) Another aspect of base acquisition that plagued the Air Force was sharply rising construction costs. For example, the expense of laying medium strength concrete pavement rose from $18 per square yard in April 1965 to $36 in December. This inflationary trend flowed from construction mobilization costs including labor, new equipment and spare parts, and the reliance on cost-plus-fixed-fee contracts.* In the cases of Cam Ranh Bay and Phan Rang, overall costs during 1965 increased about 40 percent over the original programmed expenditures.[27]

([redacted]) Because of the generally inadequate construction situation of 1965 the Air Force recommended greater civilian and military commitments to SEA projects, such as increased production of AM-2 matting and building a number of shallow draft ports in addition to developing deep water ports and docking facilities.[28] As concerned the bases, the various delays in site selection prompted McNamara to recommend more concentrated analysis on where and how to build them for contingency operations. At the end of the year both the Air Force and Army began looking into improved planning for contingency bases. Major objectives included improved Army-USAF coordination, expansion of engineering staffs,and more realistic joint reviews.[29]

([redacted]) In December, in order to further improve construction support for the Air Force, the Air Staff endorsed a JCS plan calling for appointment of an overall theater construction engineer to plan and manage MACV construction. Of general officer rank, the theater engineer would possess authority over all Department of Defense (DOD) construction agencies in Vietnam, military and civilian, with the exception of construction units assigned directly to combat forces. Both MACV and CINCPAC opposed the plan, favoring the existing organization wherein

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* RMK-BRJ operated under a cost-plus-fixed-fee contract.

the former controlled coordination and management. General Westmoreland also proposed that he receive all DOD construction money for Vietnam and that his engineering staff be increased by 24. On 20 December, the Joint Chiefs approved the new post and forwarded their recommendation to Secretary McNamara. On 6 January 1966 Deputy Defense Secretary Vance approved the proposal, emphasizing that this "boss" would have full authority in programming and executing Army, Navy, and Air Force construction.[30]

Prime Beef and Red Horse

(U) Aside from the heavy construction of the expeditionary and permanent airfields, the Air Force required smaller engineering teams for lighter tasks. Several Prime Beef (base engineering emergency force) squadrons helped fill this need.

([redacted]) Each Prime Beef team included 24 to 45 military personnel sent on 120 days of temporary duty to Southeast Asia in order to accomplish specific tasks at pre-selected bases.* Teams carried only their own hand tools. One of the earliest and most critical jobs that faced Prime Beef units was the erection of steel bin revetments to protect aircraft parked close together. These engineering emergency teams were also assigned the tasks of building personnel shelters and erecting water supply and POL inflatable structures. The first three teams from SAC, ATC and ADC deployed in August and worked on steel bin revetments. Each team was commanded by a qualified civil engineering officer. A total of 14 teams moved to Southeast Asia during August-December 1965 including TAC, MATS, AFLC and AFSC units.[31]

([redacted]) These engineering units provided the Air Force with the flexibility to respond to the emergency situation in Southeast Asia. It was hoped that all SEA

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*Established in October 1964, Prime Beef teams had been used in other countries including the Dominican Republic. But the largest number of teams by far had been deployed to Southeast Asia.

[redacted]

bases would eventually possess Prime Beef teams in order to cope with unique base requirements.[32]

(U) As opposed to the light, emergency tasks performed by Prime Beef personnel, Red Horse (rapid engineer deployment - heavy operational repair squadrons, engineering) units provided the Air Force with the capability to repair bomb damage and construct facilities just short of the type of heavy work done by the Army's troop construction battalions. Red Horse units complemented Prime Beef teams and were deployed on one-year tours of duty. Their assignments included the construction or installation of cantonment areas, personnel and medical facilities, utility systems, bolted steel POL tanks, and supply, ammunition, and motor pool areas.[33]

([redacted]) Based on requirements and an OSD memorandum of 10 May 1965, the Air Force activated on 15 October two 400-man civil engineering squadrons (heavy repair) and assigned them to Southeast Asia. After PACAF proposed their deployment to Cam Ranh Bay and Phan Rang, CINCPAC on 23 October forwarded a request to the JCS for assignment of the 554th and 555th heavy repair squadrons to Phan Rang and Cam Ranh in January 1966. Following JCS approval, TAC organized and trained the squadrons at Cannon AFB, N.M., assisted by ATC.[34]

([redacted]) In fiscal year 1967, the Air Force planned to deploy four additional heavy repair squadrons to Southeast Asia as part of the Phase IIA buildup. Secretary of Defense McNamara approved on 11 December and funds for them were included in the fiscal year 1966 supplemental budget request. Training of the squadrons began in December, with their deployment dates set for July, August, September, and October 1966, depending on the procurement and delivery of their heavy equipment. The Air Staff hoped that this advanced planning and funding would enable the units to be ready to move starting in mid-1966.[35]

([redacted]) The rationale behind the Red Horse units was that they would help overcome the dearth of heavy construction units and support the Air Force in a timely

[redacted]

manner. At the close of the year the Army was apprehensive that the role of USAF heavy repair units might infringe on the Army's mission. However, from the standpoint of the Air Force, the major consideration was that the Army had not moved its units rapidly and effectively enough to meet USAF requirements, delaying the opening of needed bases and forcing unit deployment postponements.

III. NONNUCLEAR AIR MUNITIONS

[redacted] During the first year of major SEA operations, the Air Force flew more sorties and dropped more munitions than in any single year of the Korean War. In 1965 it expended 148,751 tons of munitions against the enemy in the theater as compared to a peak expenditure of 146,163 tons against Communist forces in Korea in fiscal year 1953, the last year of that earlier limited war. It flew 25.4 sorties per tactical aircraft in December 1965 in SEA operations as compared to 22 sorties in Korea in June 1953. The difference in mission character between the two wars was seen in the fact that 22.2 of the 25.4 Vietnam sorties were in support of ground forces as contrasted with 12 of 22 in Korea.[1]

[redacted] As noted above, the large-scale U.S. intervention to avert a Communist takeover in Vietnam created a sudden demand for air munitions and critical, if temporary, shortages. In July 1965 Headquarters USAF established an ad hoc committee to analyze munition development and procurement, and it met periodically thereafter. The Air Force subsequently adopted a policy of strict allocation of certain munitions to each major command to ease the situation pending expansion of ordnance production. Older bombs were brought out of reserve, some of World War II and Korean War vintage, to take up the slack.* In late 1965 the Air Staff also directed a redistribution of certain items of ordnance from WRM storage around the world. In addition, the Air Force sought to repurchase munition assets, especially general purpose bombs (GPB's), previously provided U.S. allies under the military assistance program.

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* Some heavy general purpose bombs used in Vietnam were produced as far back as 1943. According to Secretary Zuckert, "these older conventional bombs are serviceable weapons and are still highly suitable for the variety of operations involved." (Memo (C), Zuckert to SECDEF, 9 Mar 65, subj: Alleged Supply Problems in SEA).

(S-[redacted]) In the matter of the WRM inventory, levels were set in accordance with the logistic policy and force structure approved by the Secretary of Defense.* For example, on 15 May OSD directed the establishment of a 180-day WRM inventory in order to support 121,000 sorties. Three months later it revised this guidance and ordered a war readiness inventory to support 165,000 tactical fighter, 15,000 special air warfare, and 3,600 B-52 sorties. OSD's policy change was based on a USAF analysis which considered the number of sorties which could be flown against assigned targets given the Air Force's Southeast Asia force structure and overall capability.[2]

(S-[redacted]) Funding for the increased munition expenditures was provided through several emergency budget submissions. The fiscal year 1965 budget included $165 million for USAF ordnance. Congressional approval of supplemental funds and several reprogramming actions increased the total for the year to $316.3 million. The additional funds went for the purchase of dispenser ordnance, new 500-pound bombs, and 20 mm training ammunition. The basic fiscal year 1966 budget originally asked for $284.7 million for air munitions. Congress approved a supplemental request to bring the total to $295 million. Subsequently, it also authorized an additional $268.8 million for ordnance purchases. As still more units deployed to Southeast Asia, the Air Force found it necessary to request still more money for munitions. Other fiscal year 1966 requests were approved to bring the final total to $1.307 billion. The procurement would include such items as 750-, 500-, and 250-pound general purpose bombs, 2.75-inch rockets, 20 mm ammunition, and dispenser munitions.[3]

Critical Ordnance Categories

(S-[redacted]) Perhaps the most serious shortage the Air Force faced was 750-pound M-117 general purpose bombs. By mid-1965 it became clear that the inventory of this

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* See Chapter I, section on War Readiness Materiel.

[redacted]

USAF OPERATIONS SEA 1965

	PACAF SORTIES			SAC SORTIES			
	TOTAL	ATTACK	TONS	TOTAL	ATTACK	TONS	TOTAL TONS
JAN	764	764	2,716	---	---	---	2,716
FEB	1,524	1,224	2,507	---	---	---	2,507
MAR	2,432	2,131	5,750	---	---	---	5,750
APR	3,780	3,135	6,804	---	---	---	6,804
MAY	4,892	3,157	6,913	---	---	---	6,913
JUNE	4,345	3,939	10,252	30	27	555	10,807
JULY	5,829	4,864	12,595	149	147	2,856	15,451
AUG	5,932	5,500	12,659	177	165	3,418	16,077
SEP	7,351	6,467	13,120	327	322	6,744	19,864
OCT	8,126	6,307	13,211	297	294	6,094	19,305
NOV	9,777	7,636	14,796	312	310	6,497	21,293
DEC	9,948	8,121	15,094	315	307	6,170	21,264
TOTALS	64,700	53,245	116,417	1,607	1,572	32,334	148,751

SOURCE: Logistics Readiness Center Branch, DCS/S&L 26 Jan 1966. Total sorties includes reconnaissance and other sorties.

[redacted]

particular munition would be depleted before mid-1966 if the expenditure rate continued at a high level. The 750-pounder was used by all tactical jet aircraft as well as SAC B-52F's operating from Andersen AFB, Guam. In fact the great load-carrying capacity of the B-52 was primarily responsible for the rapid expenditure of the ordnance. The B-52's first struck the enemy on 18 June 1965 and from that time on the weight and intensity of the heavy bomber raids increased.* During 1965 SAC strikes included as few as six B-52's and as many as thirty. Thirty of the SAC heavy bombers were stationed at Guam and together on one mission could drop 570 tons of ordnance. This represented the B-52 capacity of 51 750-pound bombs.[4] Based on programmed expenditures and actual inventory, the progressive status of the 750-pound inventory assumed the following form during 1965 and 1966:[5]

Date	WRM Inventory Objective	Inventory (Actual)
1 Jan 1965	54,956	378,048
30 Jun 1965	54,956	350,507
31 Dec 1965	268,895	187,365
30 Jun 1966	268,895	42,961
30 Jun 1967	287,381	224,363

([redacted]) Thus, the USAF predicament was how to circumvent actual depletion of the inventory prior to new and increased production of general purpose ordnance.+ Concerned about shortages, Secretary McNamara on 25 June requested

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* Although SAC flew only one mission in June and five in July, the tempo increased substantially between August and the end of the year. During July-December 1965, SAC flew 135 missions over South Vietnam. (Hist of SAC, Jul-Dec 65, Vol II, p 269). (S-Gp 4)

+ 750-pound bomb production was ended shortly after the end of the Korean War.

Assistant Secretary of Defense Paul R. Ignatius (Installations & Logistics) to personally follow the consumption of munitions in Southeast Asia to make certain that stocks were satisfactory and adequate measures were being taken to increase production.[6] On 10 July, the Air Force promulgated its initial purchase request for the 750-pound M-117 bomb, thus opening up the iron bomb production line. And in early September, the JCS asked CINCPAC for an analysis of expected expenditures through February 1966. The CINCPAC study indicated that 750- and 500-pound general purpose bombs would approach the critical point by that date. The Air Force agreed.[7]

[redacted] Since new production deliveries of 750- and 500-pound bombs would not start until August 1966, these munitions would not be available in Southeast Asia until October 1966. Programmed production was not expected to equal or surpass consumption until mid-1966 for the 500-pound bomb and late 1966 for the 750-pound bomb. In September and October the Air Staff sought to alleviate the impending shortage of 750-pound ordnance by directing that other munitions be substituted. Recommended substitutions included the MK-82, M-64, and M-78 500-pound bombs, BLU-29 Napalm B used with the Hayes dispenser system;* BLU-3B bomblets;+ and the M-65 1,000-pound GPB. The Air Staff planned to shift additional general purpose bombs from global assets, although Secretary McNamara precluded withdrawal of USAFE assets committed to the North Atlantic Treaty Organization (NATO) without either his or Deputy Secretary Vance's prior approval. The same arrangement held for withdrawing war readiness materiel from ANG or USAF reserve forces. In October, the Air Staff concluded that it would make no attempt to gain OSD approval for NATO, ANG, or reserve

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* Used for testing only; BLU-29 Napalm B production was later terminated.
+ The CBU-2 bomblet dispenser, carried by tactical fighter aircraft, held 406 BLU-3B fragmentation bomblets. The BLU-3B bomblet was approved by OSD for use with the B-52 on 19 December 1964.

withdrawals. Overall, given the actions under way, it felt that the general munitions situation was "acceptable." The Air Force could support the current Phase I plan which called for 10,000 tactical sorties in addition to a B-52 buildup to 600 sorties per month in December 1965 leveling off to 300 a month during 1966.[8]

([redacted]) Among alternatives to using 750-pound bombs was the conversion of 500-pound MK-78 chemical bombs to a general purpose configuration. The Air Force began this modification in October and produced approximately 26,000 MK-78 bombs for SEA purposes. Also, the MK-79 1,000-pound chemical bomb could be converted to the general purpose mode for use with the B-52. After the Air Staff approved this proposal in October, the Air Force arranged with the Army to convert 58,000 M-79 bombs to a high explosive fill at a cost of $18 million. The Army planned to award an actual conversion contract in early December. However, before any of the substitutes for the 750-pound bomb could be employed, testing was mandatory. The Air Force pursued extensive testing of substitutes at Eglin AFB in late 1965. The specific objective was to decrease expenditures of the 750-pound general purpose bombs in order to maintain an emergency stock of 23,000 NATO and 27,000 SEA bombs until new production began in August 1966.[9]

([redacted]) The Air Force used the 500-pound bomb in lieu of the M-117, and its inventory also dropped drastically. The World War II series, M-64 and M-78, was used along with the newer MK-82 by all tactical aircraft and could be carried by the B-52. The composite 500-pound bomb inventory including the MK-82, M-64 and M-78 follows:[10]

Date	WRM Inventory Objective	Inventory (Actual)
1 Jan 1965	61,592	173,577
30 Jun 1965	61,592	153,453
31 Dec 1965	185,803	85,460
30 Jun 1966	185,803	67,403
30 Jun 1967	276,615	248,996

[redacted]

[redacted] Other USAF ordnance in the critical category included the BLU-23 500-pound napalm bomb carried by tactical jet planes as well as the A-1 and T-28, the BLU-27 750-pound napalm bomb employed primarily by jet fighter aircraft; MK-81 250-pound general purpose bomb and CBU-2, CBU-24 and CBU-12 dispenser munitions used by high performance fighters; the rocket motor configured for the 2.75-inch M-151 fragmentation warhead; 20-mm cartridges fired by the M-39 and M-161 guns of the F-100, F-105, and F-4C and B-57 aircraft; and the MK-24 flare.[11]

[redacted] One of the most interesting cases involved the 2.75-inch rocket motor used by all tactical and special warfare forces. The USAF inventory of this munition on 30 June 1965 totaled 1.1 million motors, which appeared quite satisfactory to support SEA operational requirements. However, about that time, introduction of a new fragmentation warhead changed the outlook. The 2.75-inch M-151 fragmentation head proved highly adaptable to Southeast Asia operations and consequently demand for the motor increased. New procurement was promptly included in the fiscal year 1966 program, but delivery was not scheduled until early 1966. Thus, the inventory level would not improve until 1967 when production would finally exceed consumption. In essence, the requisite number of rocket motors was not available, and the Air Force had to substitute general purpose bombs, napalm, and dispenser ordnance. To alleviate in part the dearth of motors, the Air Force planned to use approximately 7,000 five-inch Korean War vintage rockets per month for the A-1 aircraft during 1966. The following depicts the actual and programmed stock of the 2.75-inch rocket motor:[12]

Date	WRM Inventory Objective	Inventory (Actual)
1 Jan 1965	547,683	1,413,506
30 Jun 1965	547,683	1,153,115
31 Dec 1965	623,683	704,655
30 Jun 1966	623,683	463,203
30 Jun 1967	868,170	649,296

[redacted]

([redacted]) While the USAF inventory of 20-mm cartridges proved adequate for immediate SEA operations, the Air Force also took steps to expand the production base in 1965. More than 28 million rounds were in stock on 30 June 1965 and the Air Force planned to increase production to approximately seven million rounds per month by the close of 1966. Production would exceed consumption by 30 June 1966 with the inventory increasing after that point.[13]

Allocations

([redacted]) Because production of ordnance would lag consumption for some months, the Air Force initiated a system of allocations on a major command basis, to assure availability of specific munitions or their substitute. It made first allocations on 1 September and reviewed and adjusted them frequently during the remainder of 1965. For example, it established strict controls on the 750-pound bomb which, as noted, called for substituting the M-64 and MK-82. Such allocations insured that critical munitions stock would be protected. Among items substituted were smaller bombs in the 220- to 260-pound range (M-81, M-88, M-57, MK-81) employed in various combinations on the B-57 and A-1E planes.[14]

([redacted]) In order to sustain its Phase I sortie rate through early 1966, the Air Force convened allocation review meetings on 20 September and 8 November attended by PACAF, SAC, and AFLC representatives. They discussed global stocks and agreed on an allocation of all conventional bomb resources that would permit maintenance of the Phase I sortie rate until increased production resolved the problem. In their view, the critical period would occur in the fourth quarter of fiscal year 1966.[15]

([redacted]) During late November and December, the Air Force not only continued to allocate general purpose bombs and other conventional bombs, but also

restricted noncombat (aircrew training) consumption of potentially critical items including 2.75-inch rocket motors, 20-mm ammunition, and MK-24 flares. Live ammunition training was curtailed except for combat control team and replacement training unit crews going to Southeast Asia.[16]

Obtaining MAP Assets

(S) As USAF operations increased and the need for conventional ordnance became greater, the Air Force also moved to obtain excess assets which had previously been delivered to U.S. allies under the military assistance program. In September and October it repurchased more than 18,000 bombs. AFLC handled the redistribution actions, obtaining approval both from the nation concerned and the unified command in the area. Should either the country or command object, the Air Staff and OSD would review the case in point. This procedure accorded with an OSD memorandum of 28 August. As of early November the following ordnance had been repurchased:[17]

Bomb Type	Country	Number	Original Cost
1,000 Lb., M-65, M-65A1	Belgium	2,430	$1,044,900
	Norway	792	340,560
	Greece	400	172,000
	Netherlands	1,350	580,500
500 Lb, GP, M-64	Belgium	2,538	558,360
	Greece	5,000	994,000
	Netherlands	750	165,000
	Norway	397	87,340
	Taiwan	5,000	1,100,000

(S) The Air Force also reacquired 5,570 of 7,562 general purpose (750-pound) bombs which it had sold to the German firm of Kaus and Steinhausen in 1964. The company had planned to extract the nitrate for fertilizer and reduce the casing for scrap. Originally produced at a cost of approximately $330 each, the bombs were sold for a small sum and then repurchased for about $21 each.

The Air Force noted that the current cost for a newly produced bomb was $440 and it therefore felt justified in obtaining them from the German firm at a higher price than the 1964 disposal figure.*[18]

Special Express

([redacted]) Perhaps the most significant innovation in the munition supply line between the continental United States and Southeast Asia involved establishing Project "Special Express." Suggested by PACAF in January 1965 and approved by Headquarters USAF, the objective of Special Express was to bypass Clark AB Philippines as a supply point and resolve the problem of the vulnerability and paucity of munition storage areas on the SEA mainland. Prior to April 1965, Clark AB was the primary supply nexus for USAF air munition support. It was clear, however, that Clark could no longer serve adequately this purpose. The practice was to unload USAF munitions at Subic Bay, and move them by truck to Clark for storage. Later, when needed, they were trucked back to Subic Bay and loaded aboard LST ocean craft for transport to Vietnam. The Air Force decided to eliminate this inefficient system and go to a direct CONUS-to-user system.[19]

([redacted]) In April 1965 the Air Force leased five vessels through the Military Sea Transport Service for use exclusively as USAF munition carriers. The first ship sailed from the Naval Weapons Station, Concord, Calif., on 25 April. The Air Force added another five ships to the cycle in June and planned to expand to 12 vessels by early 1966 and to 15 by mid-1966. These ships loaded at the Concord station, stopped at Subic Bay for fuel, stores, and classified orders (1-2 days), and then discharged at Da Nang, Cam Ranh Bay, Phan Rang, Saigon, and Bangkok. In the majority of cases, landing craft were used for off-loading. Although at first bomb bodies were shipped without components, later complete rounds were assembled and loaded at Concord, thereby eliminating MATS airlift of the bomb

* General purpose 750-pound bombs had previously been dumped into the North Sea at a cost per bomb disposal of about $18.50. (Memo for Gen Corbin, "Sale and Purchase of 750# Bombs to German Firm," 19 Apr 66, by Lt Col R. W. Givens, SAF-Legislative Liaison).

components. By the end of 1965, 10 ships operated under Special Express, assuring the Air Force of about a 90-day supply for theater operations.[20]

(S-Gp-4) Special Express was one of the most successful and imaginative USAF operations devised to support the war in Vietnam. It contained an inherent selectivity in that ships were loaded so that commanders could in fact specify various items for discharge. The transit period of 45-60 days included loading, sailing, and discharge time. As much as 30 days on station (off the coast of Vietnam) could be accommodated by Special Express. According to a report prepared for Secretary of the Air Force Harold Brown* by Gen. E. W. Rawlings (USAF, Ret.), this type of floating storage was "not only appropriate but essential" in view of the shortages in certain ordnance items and the lack of storage facilities in Vietnam. Rawlings suggested that the Air Force expand Special Express to include other supplies such as POL (which had been done to a limited extent).[21]

Adjustments: Blending the Old With the New

(S-Gp-4) Through allocation, redistribution (including MAP assets), floating storage, and selective mixture of ordnance based on targets and aircraft, during 1965 the Air Force managed to alleviate its shortage of selected munitions. Both Phase I and II tactical operations were affected by ordnance shortages. However, by tapping available avenues while increasing production and establishing additional sources of supply, the Air Force provided adequate munitions for tactical planes in what amounted to perhaps an acceptable but not always desirable (or ideal) mix.[22]

(S-Gp-4) The question of bomb and ammunition shortages was very sensitive politically. Defense Secretary McNamara, under fire from Congress and the

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* Brown succeeded Secretary Zuckert on 1 October 1965.

press, admitted that in some cases demand exceeded the production rate. During testimony in January 1966, in reply to a question by Rep. Melvin Laird on ammunition shortages, McNamara said:[23]

> I believe that no military operations in South Vietnam have been adversely affected by equipment or munition shortages. When I say that, I want to repeat what I said in my statement, that there are certain inventory levels that are below desired objectives and, therefore, are short in relation to the desired objectives. That is why we have inventory levels--to draw them down when we need them.

[redacted] One of the striking characteristics of the munition situation was the significant blend of the old with the new. While much World War II and Korean War ordnance was still being expended, new munitions also became available. Ordnance that entered the USAF inventory during 1965 included several already mentioned: the MK-81 250-pound and MK-82 500-pound general purpose bombs, the 2.75-inch M-151 fragmentation warhead, the 500-pound (BLU-23) and 750-pound (BLU-27) napalm bombs, the ADU-253 Hayes dispenser, and others. In addition, other conventional ordnance was under development specifically for Southeast Asia by late 1965, including such items as penetration bombs, improved rocket heads, denial weapons, and anti-personnel explosives.[24]

[redacted] In essence, then, although the Air Force encountered serious difficulties in obtaining certain conventional munitions, it inaugurated several vital measures that helped alleviate the situation. Unlike the construction obstacles, in the area of ordnance, the Air Force faced no trouble with the Army or Navy. The Air Force could procure most of these munitions through the Army or Navy using military interdepartmental purchase requests. Either service could process this kind of request in less than 30 days, about the same time needed for a direct USAF request to industry.[25]

[redacted] When considering the great increase in expenditure of conventional ordnance during 1965, it was not surprising that the Air Force encountered

difficulties in supplying its Southeast Asia operations. But overall the Air Force succeeded in furnishing an entire range of ammunition for its operational aircraft. Adequate munitions were available for assigned targets in both North and South Vietnam and Laos. Moreover, during the year the Air Force established procedures and laid the foundation for increased production and supply of all conventional munitions to support its operations in 1966.[26]

IV. AVIATION FUEL SUPPORT IN SOUTHEAST ASIA

([redacted]) The tremendous increase in USAF tactical operations during 1965 was particularly mirrored in the consumption of jet fuel and aviation gasoline. In 1964, USAF operations in Vietnam required 167,200 barrels of jet fuel and 240,700 barrels of aviation gasoline. For Thailand the figures were 276,400 and 52,000 respectively. In 1965 consumption in Vietnam rose to 2,587,000 barrels of jet fuel and 471,000 barrels of aviation gasoline, and in Thailand, 2,627,000 and 94,000 barrels respectively.[1]

The Need for POL Facilities in Vietnam

([redacted]) During most of 1965, the Air Force relied primarily on the Army and Navy to supply terminal storage and in-country distribution of POL. They in turn employed commercial oil companies (Esso, Shell, Caltex) for storage and distribution facilities in Vietnam and Thailand. At the beginning of 1965, USAF storage was limited to a few on-base tanks located mostly in the Saigon area. Later, as the military situation changed, the Air Force concluded that the commercial facilities would no longer suffice and that it was necessary to build new military facilities both on-base and at key terminals to ensure an adequate resupply capability. POL support now entered a critical period as increased USAF operations and VC activity, which interrupted normal distribution in-country, created both storage and distribution problems.[2]

([redacted]) To augment existing storage at Bien Hoa, Tan Son Nhut, and Nha Trang, the Air Force planned to build permanent tankage at Da Nang (20,000 barrels), Cam Ranh Bay (70,000 barrels), Phan Rang (80,000 barrels), and Qui Nhon (80,000 barrels). In the meantime it took steps to provide interim and semi-permanent facilities such as portable fueling systems and bolted steel storage tanks. These were shipped in sufficient numbers toward the

end of the year to meet immediate operational needs.[3]

([redacted]) The portable hydrant system was especially useful in augmenting POL supplies in Vietnam. Sometimes called a "bladder" system, this movable hydrant equipment was air-transportable and designed to support tactical units at forward bases. The system included 50,000-gallon bladders, turbine pumps, and water-separating dispensing carts, all of which could be carried in a C-124 and assembled in one day.[4]

([redacted]) Of the 26 portable systems that it possessed, the Air Force had 18 deployed to Southeast Asia by December 1965. In addition, procurement was under way for early 1966 delivery of better portable systems, which possessed less weight and more storage and greater dispensing ability. The majority would be assigned to PACAF with some allocated to TAC, MATS, and USAFE to replace units withdrawn to meet SEA operational needs.[5]

([redacted]) Early in the year, while it took initial steps to provide a system for in-country storage and dispensing, the Air Force supported CINCPAC's recommendation that called for floating storage in Subic Bay. Two tankers loaded with POL would provide backup for the commercial terminal at Nha Be near Saigon, which was considered particularly vulnerable to VC sabotage. On 3 March the JCS approved CINCPAC's proposal and, by early April, two tankers were on station at Subic Bay loaded with JP-4 and aviation gas, as well as POL products for the Army. The Air Force paid about $4,000 per day for its part of the storage cost.[6]

Pipeline Requirements in Thailand

([redacted]) Storage and distribution limitations existed in Thailand as well as South Vietnam. USAF stocks in Thailand were stored along with those of the Royal Thai Air Force (RTAF) except at Don Muang, where both used commercial facilities. Base tanks belonged to Thailand while commercial storage in the

Bangkok area--which comprised approximately 1,600,000 barrels--was owned by private firms. Another 1,200,000 barrels in commercial storage was situated near Si Racha. The Air Force soon realized that, as operations from Thailand increased, existing storage would be inadequate and that acquisition of a petroleum distribution network was paramount.[7]

([redacted]) USAF facilities were especially desired at Korat, Udorn, Ubon, Don Muang, and Sattahip. At Korat 238 miles of tactical pipeline, allied equipment, and steel bolted tanks--which could provide 380,000 barrels of storage--had been prepositioned under the Strategic Logistics Assets-Thailand (SLAT) program. Early in 1965 the Air Force requested, and JCS and OSD concurred in, the construction of a tactical "invasion" type pipeline from Si Racha to Korat provided the Thai government consented. The Air Force estimated that the pipeline could be built in about 100 days by a troop construction force. The U.S. embassy in Bangkok recommended a permanent line, but the military (USAF, JCS, and CINCPAC) felt the tactical version was preferable because of construction time and cost factors.[8]

([redacted]) Preliminary engineering studies began in April. However, in May the U.S. embassy informed the Air Force that the Thai government had refused permission to install the tactical pipeline, preferring instead a permanent line. The Thais also declined to allow U.S. Army construction troops in the country. On the other hand, the government did approve construction of terminal facilities and a submarine unloading line at Si Racha along with additional storage at Don Muang, Si Racha, Korat, Ubon, and Udorn. On 19 May the Defense and State Departments jointly asked the U.S. ambassador to inform the Thai government of continued American interest in expediting the pipeline construction and of deploying the construction troops. If Thailand agreed, pumping stations, applicable to both permanent and tactical pipelines, could be started.[9]

[redacted]

(S [redacted]) When Thailand remained adamant, CINCPAC in July 1965 suggested a permanent line (with inland and ocean terminals) from Si Racha through Chachoengsao to a point seven kilometers north of Don Muang.* JCS approved this proposal, and General Wheeler, JCS Chairman, in forwarding it to McNamara on 17 November, pointed out that expanding USAF operations in Thailand along with the inadequate distribution system there required a permanent line.[10]

(S [redacted]) Pending an OSD decision, the Army requested immediate authorization and funding in fiscal year 1966 to begin the work.+ It also asked the Air Force to estimate its monthly POL consumption requirements for Thailand from December 1965 to June 1968. Meanwhile, the Army pressed construction of a POL unloading facility at Sattahip which was scheduled for completion by 1 July 1966. At year's end the Air Force was concerned that this vital facility might not be ready by mid-1966, thus affecting USAF forward base POL stores.[11]

(S [redacted]) There was POL construction elsewhere in the western Pacific. At Clark AB, storage tanks holding 100,000 barrels were being built, and the fiscal year 1967 construction program called for facilities for storing 200,000 barrels more. A Subic Bay-Clark pipeline received high priority and storage facilities were also approved for Kadena AB, Okinawa, and Wake Island, all aimed at assuring that Vietnam operations would not be impeded by a shortage of fuels.[12]

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* Where a railhead would be built.

+ CINCPAC assigned the Army responsibility for the terminal and distribution system for common POL in Thailand. The Army also was to provide military land transportation. (Ltr (S), Gen C.W. Abrams, Army VCofS to CSAF, subj: Comprehensive Logistic and Base Development Planning--Thailand, 29 Nov 65).

[redacted]

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2. Staff Rprt (S), Avfuel Storage in SEA, 29 Sep 65, prep by Dir/Sup & Svcs; Encl J (S) to Talking Paper for JCS, 7 Jul 65, subj: Problems Related to POL/SVN Area Supply Situation.

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[redacted]

APPENDIX 1

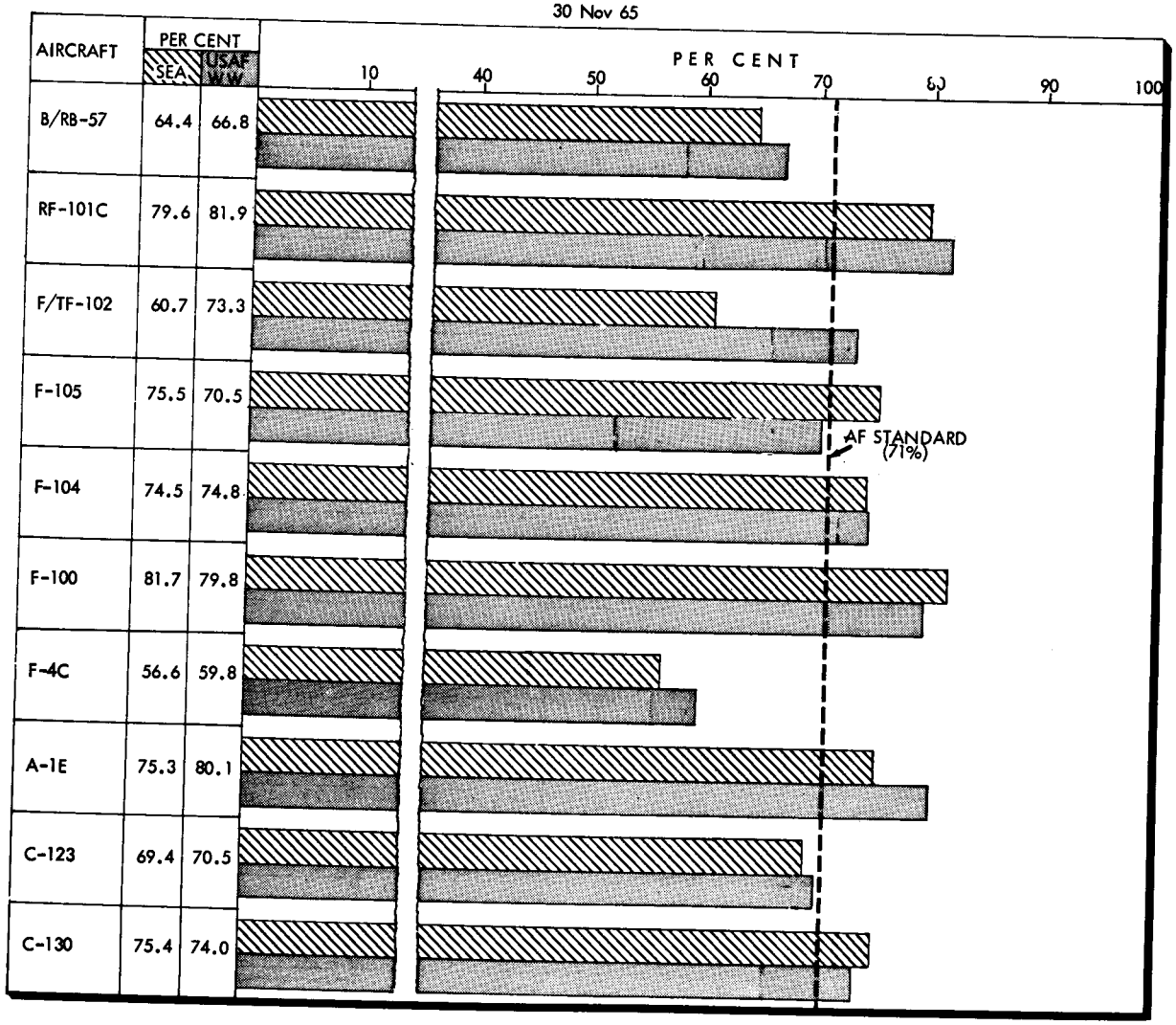
14 Jan 66

AIRCRAFT READINESS RATES
SOUTHEAST ASIA VS USAF WORLD-WIDE

OPERATIONAL READINESS[1]

30 Nov 65

AIRCRAFT	PER CENT SEA	PER CENT USAF W-W
B/RB-57	64.4	66.8
RF-101C	79.6	81.9
F/TF-102	60.7	73.3
F-105	75.5	70.5
F-104	74.5	74.8
F-100	81.7	79.8
F-4C	56.6	59.8
A-1E	75.3	80.1
C-123	69.4	70.5
C-130	75.4	74.0



[1] Includes all aircraft operated in SE Asia, regardless of Command Assignment.

Source: AF Manual 65-110,
RCS: AFLC 110-12, 30 Dec 65

[redacted]

[redacted]

APPENDIX 2

USAF NORS RATES

SOUTHEAST ASIA

PER CENT NORS

TYPE AIRCRAFT		FY 65			FY 66					
	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
A-1E	1.2	1.0	3.2	2.0	3.1	4.3	2.6	1.9	4.5	4.5
F-100	1.2	3.9	5.8	3.9	2.3	5.8	5.2	4.2	3.6	5.3
F-102	2.4	2.0	3.7	6.8	12.5	15.4	12.1	8.9	9.1	7.3
F-105	5.5	2.6	3.1	2.4	5.9	5.8	5.1	6.7	6.4	7.7
F-4C	5.5	5.7	9.2	5.3	12.4	19.7	22.8	39.5	27.3	27.1
RF-101	5.6	2.4	5.1	3.5	9.4	11.2	6.2	4.4	5.0	8.3
B/RB-57	1.4	4.7	5.3	5.9	15.9	13.0	10.2	11.4	9.8	7.8
RB-66	3.3	17.0	17.0	6.3	14.1	20.2	17.6	19.4	21.7	3.8
C-123	1.2	1.0	1.7	3.7	2.7	2.6	6.1	11.2	5.7	6.6
C-130	1.0	2.8	4.1	4.0	8.4	5.0	7.8	6.1	6.4	12.2
O-1F	1.6	3.3	3.1	2.3	2.1	2.9	2.4	3.6	3.6	4.3
B-52					4.8	5.4	5.0	4.6	16.5	4.1

Based on average possessed aircraft.

Source: 1-AF-A1 Report, 31 Dec 65

[redacted]

[redacted]

APPENDIX 3

11 Feb 66

ORDNANCE BY TYPE
SOUTHEAST ASIA

TOTAL EXPENDITURES

(USAF only; does not include Vamp, Lamp and training expenditures.)

TYPE	ITEM	FY 63	FY 64	FY 65	FY 66 (Jul - Jan)
Aircraft Gun Ammunition	20 mm HEI (M3 Gun)	-	32,000	2,971,801	2,459,267
	20 mm HEI & API (M39 Gun)	-	-	1,829,757	8,574,425
	20 mm HEI & API (M61 Gun)	-	-	373,808	3,071,115
Flares	MK 24 (MK 5/6)	4,474	19,455	78,180	105,647
Bombs	Fire				
	250# BLU-10B	-	-	1,963	6,149
	500# BLU-11B/BLU-23	3,358	2,992	14,992	8,233
	750# M116/BLU-1B/27B	1,389	2,857	11,542	28,797
	Smoke				
	PWP #100	266	5,311	13,979	9,078
	General Purpose				
	100#	-	-	12,763	10,716
	250#/MK 81 Snakeye	354	1,266	14,028	16,212
	500#	931	2,133	25,591	56,752
	750#/M117	-	-	27,683 [1]	186,154
	Snakeye 500#		-	-	9,638
	Fragmentation				
	M1A2	8,080	5,199	20,997	4,380
	Cluster, Anti-Mat'l CBU2A	-	-	393	3,452
	220/260#	157	3,455	26,776	44,198
Rockets	FRAG 2.75"	-	-	3,803	110,111
	HE 2.75"	28,509	8,516	48,298	44,560
	HEAT 2.75"	-	-	28,290	141,110
Missiles	SPARROW, AIM-7D/E	-	-	10	43
	SIDEWINDER, AIM-9B	-	-	69	68
	BULLPUP, AGM-12B	-	-	196	126
	BULLPUP, AGM-12C	-	-	-	131

[1] Earflap was implemented for B-52 expenditures out of Guam, 19 Sep 65. One-time report from initial mission thru 19 Sep 65 reflected expenditures of 27,789; subsequent two weekly reports reflected 9,887 for a total of 37,676. FY 66 Cumulative total adjusted to delete initial mission (18 Jun 65) expenditures of 1,137 each M117 for B-52. Same quantity added to FY 65 expenditures. Earflap B-52 Expenditures for Jan 66 - 7,442 each M117 and 8,198 each M64, 500# GP.

Source: EARFLAP, 27 Jan

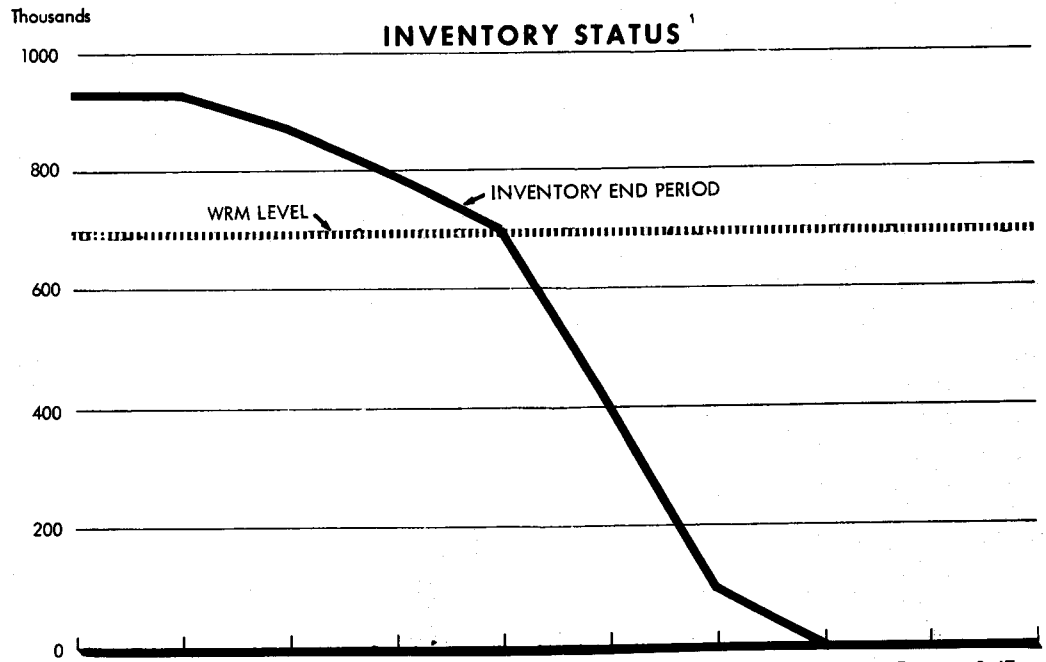
[redacted]

4 Feb 66

APPENDIX 4

SELECT CONVENTIONAL ORDNANCE

2.75" ROCKET MOTOR



ACTIVITY	FY 1-66	OCT 65	NOV 65	DEC 65	FY 3-66	FY 4-66	FY 1-67	FY 2-67	FY 3-67
Inventory Beginning Pd	1,153,115	928,168	876,157	794,611	704,655	402,346	96,354	0	0
Production	0	0	0	0	44,000	50,000	130,000	150,000	575,000
Actual Consumption	224,947	52,011	81,546	89,956					
Programmed Consumption					346,309	355,992	372,665	485,109	485,109
Inventory End Pd	928,168	876,157	794,611	704,655	402,346	96,354	0	0	0
WRM Level	699,758	699,758	699,758	699,758	699,758	699,758	699,758	699,758	699,758

MISSION	BASIS OF CONSUMPTION		MANUFACTURERS	APPROVED PROCUREMENT PROGRAM
Used for Air-To-Air and Air-To-Ground Support. Used on all Aircraft.	ACFT	FACTOR	Navy	FY 65 - 0 0
	F-100	9.56		FY 66 - 829,000 $33.2 Mil
	F-105	9.56		FY 67 - 2,606,200 $104.2 Mil
	F-4 In	9.56		
	F-4 Out	9.56		
	B-57	9.56		
	A-1E	9.56		

[1] The beginning and ending inventory during first six months of FY 66 has been adjusted to reflect a total inventory adjustment of additional 123,790.

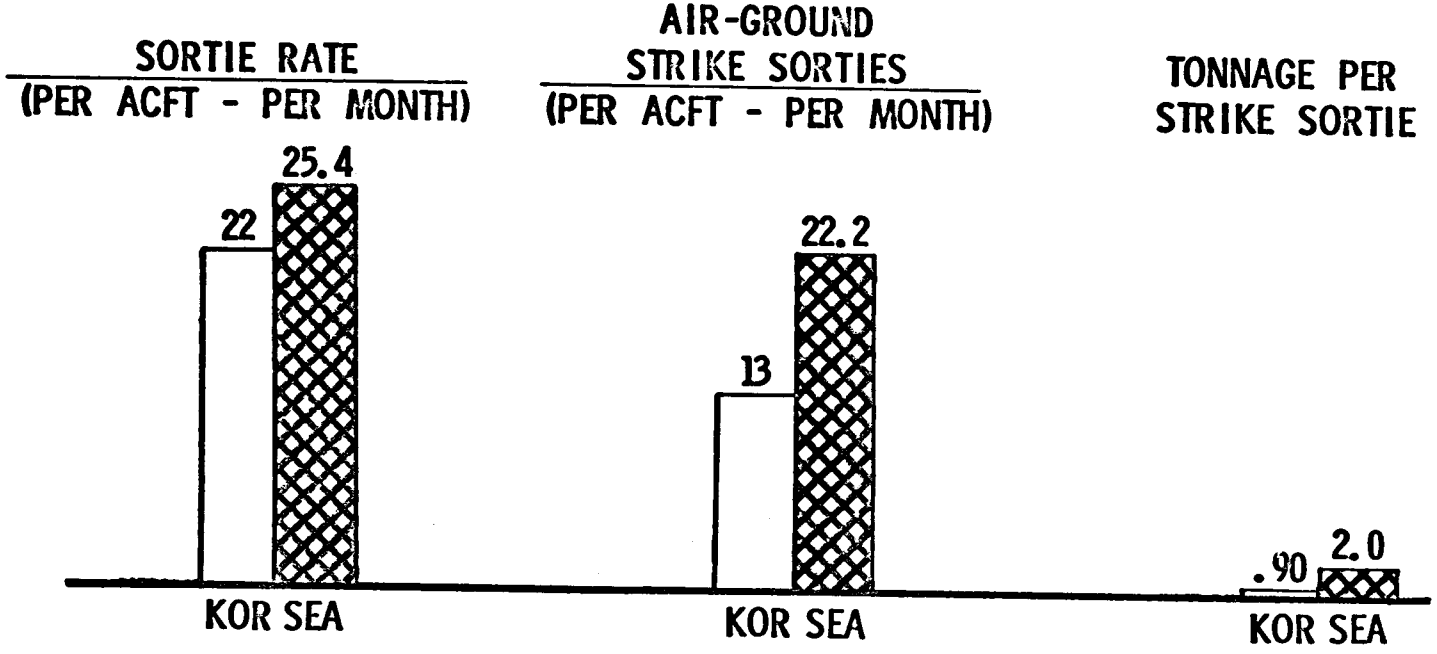
Source: DDI&L(M) 682 Report, 31 Dec 65

SORTIE RATE/ TONNAGE COMPARISON

(TACTICAL FIGHTERS)

KOREA - JUN 53

SEA - DEC 65



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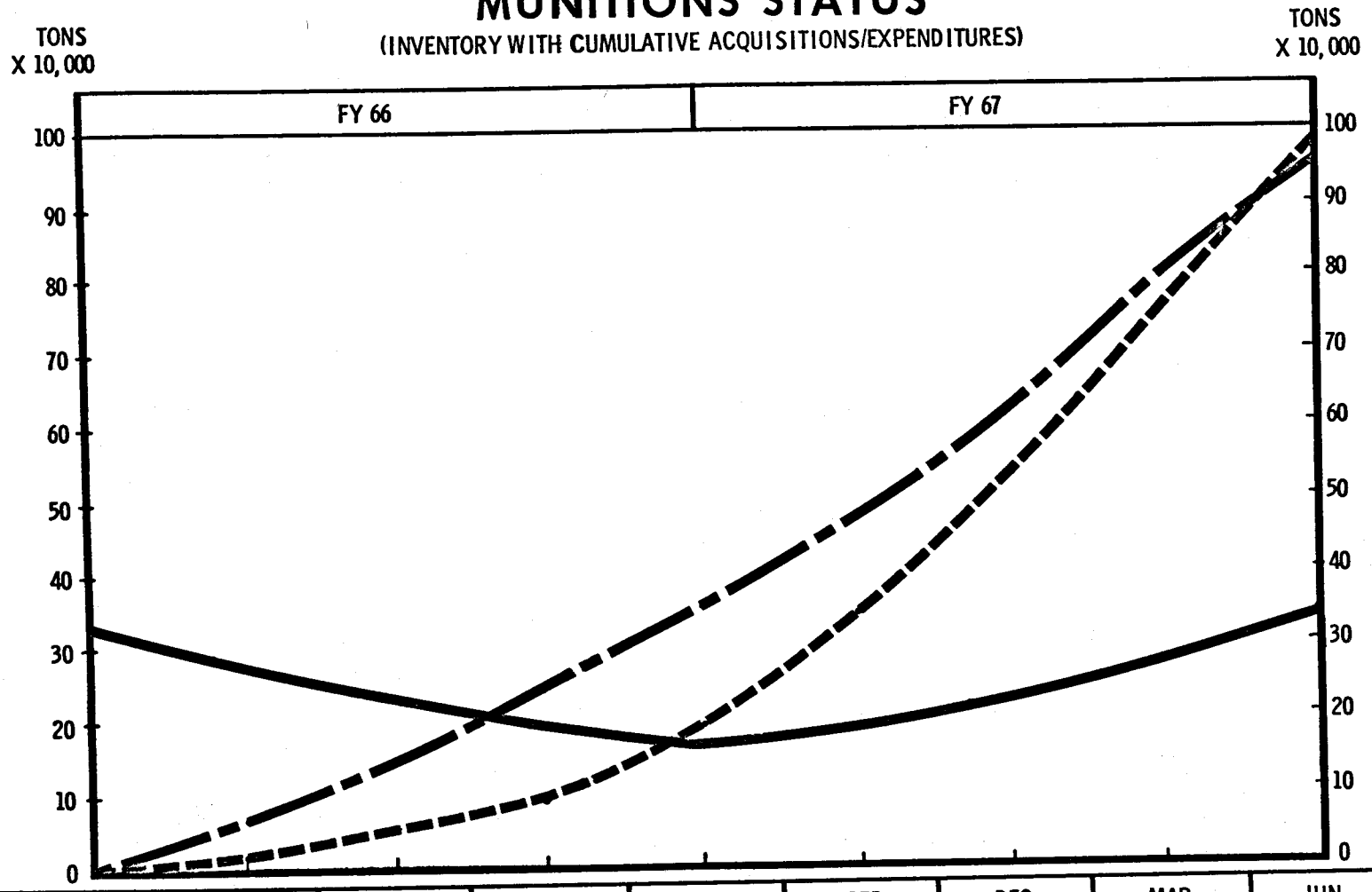
MUNITIONS STATUS

(INVENTORY WITH CUMULATIVE ACQUISITIONS/EXPENDITURES)

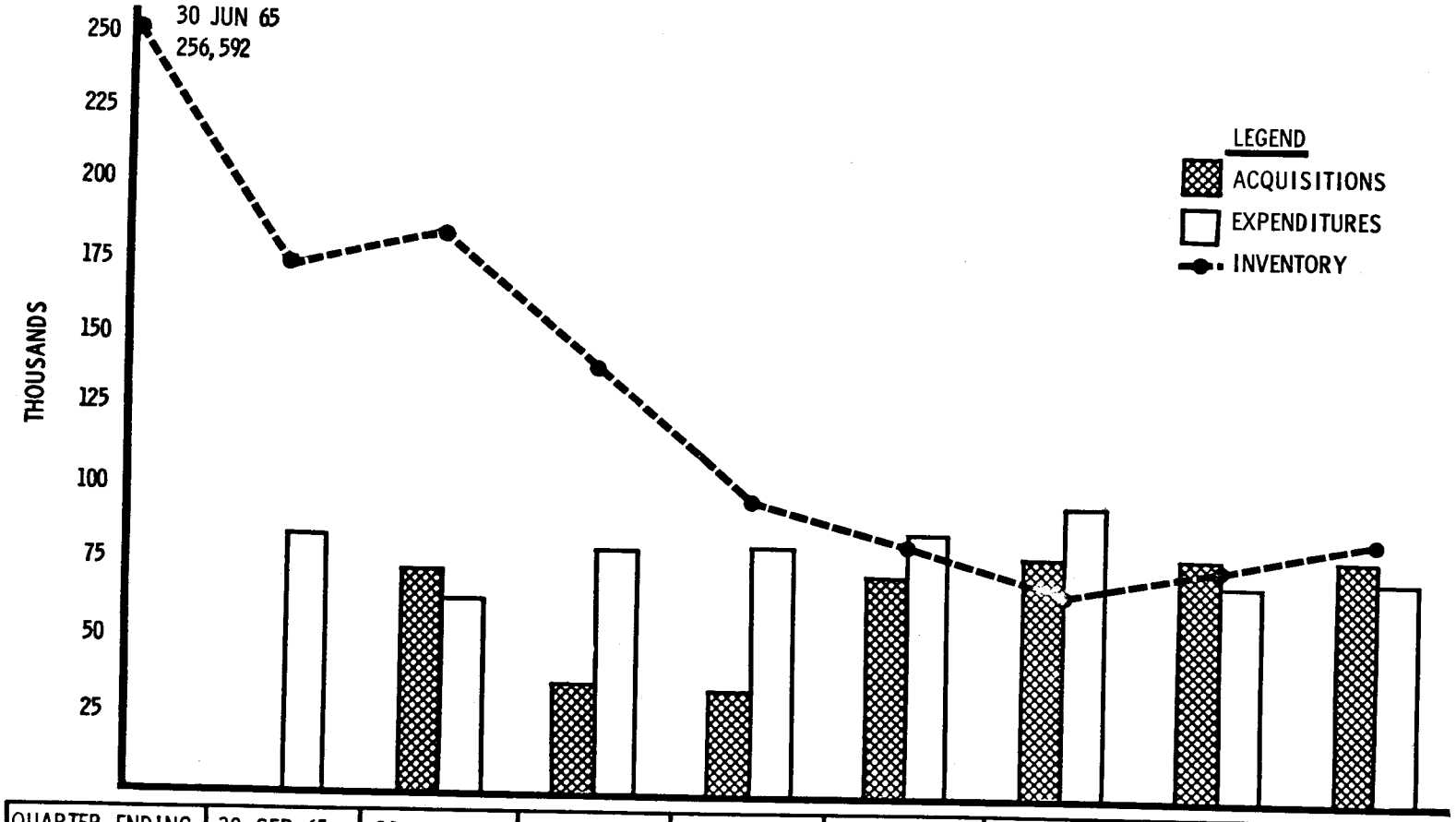


QUARTER ENDING	SEP	DEC	MAR	JUN	SEP	DEC	MAR	JUN
ACQUISITIONS	1	4	9	18	33	52	74	97
EXPENDITURES	5	13	23	34	46	61	79	97
INVENTORY	27	23	19	16	19	22	27	32

APPENDIX 6

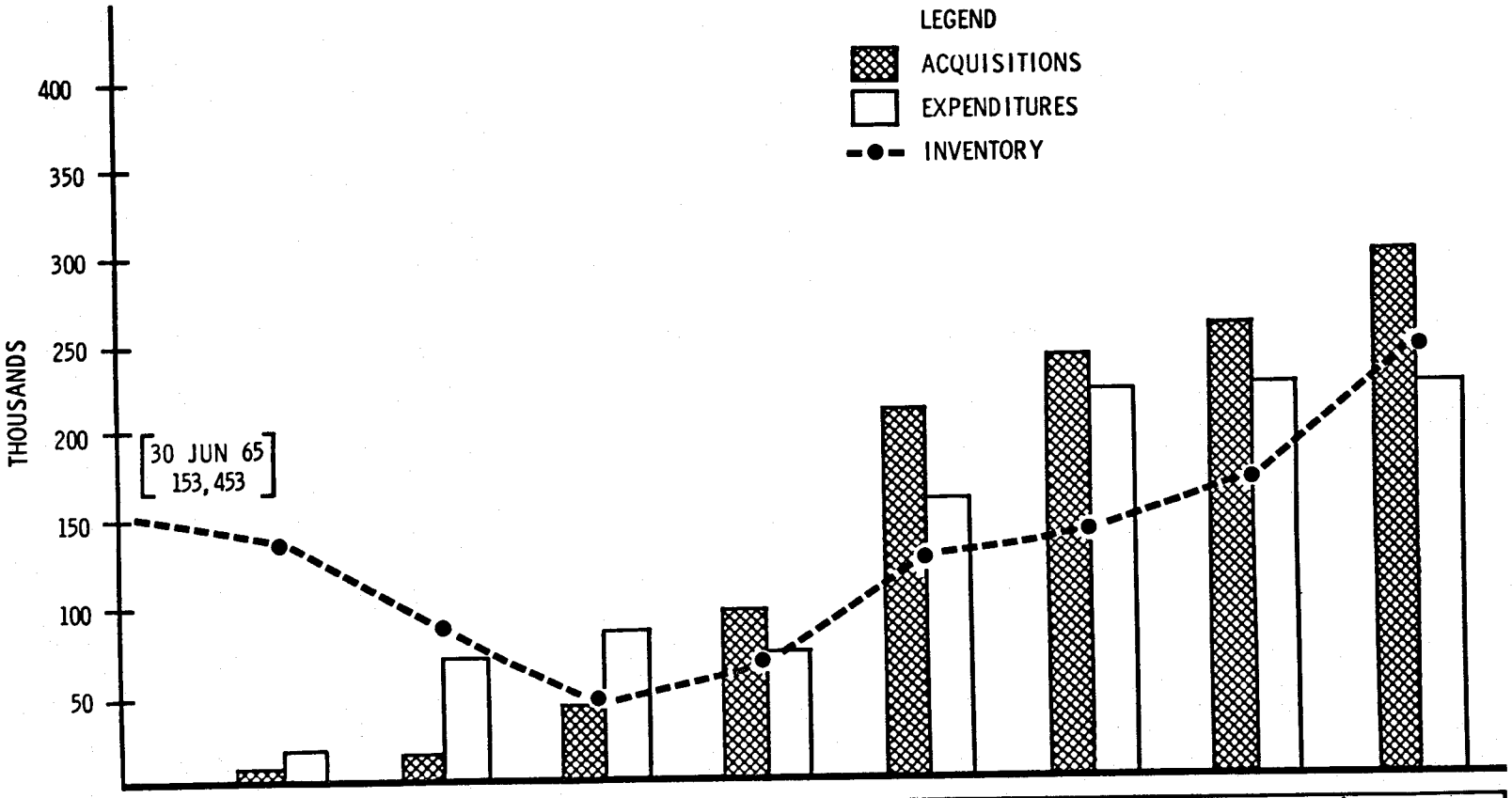
[redacted]

BOMB, GP, 100 LB, M30; 250 LB, MK81 & M57
BOMB, FRAG, 260 LB, M81



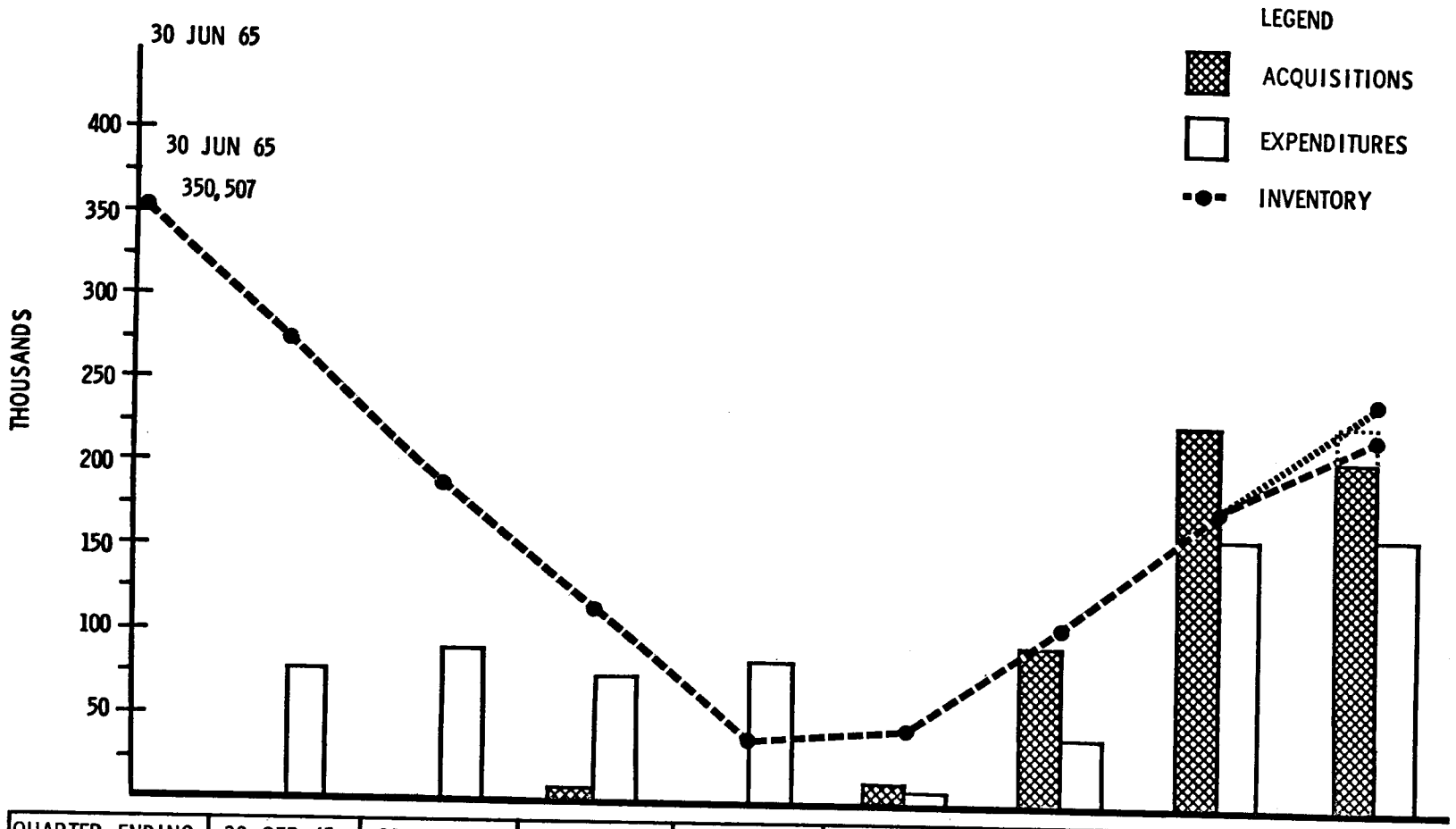
QUARTER ENDING	30 SEP 65	31 DEC 65	31 MAR 66	30 JUN 66	30 SEP 66	31 DEC 66	31 MAR 67	30 JUN 67
ACQUISITIONS	0	73,696	36,300	35,600	72,000	78,000	78,000	78,000
EXPENDITURES	83,327	62,982	79,627	79,500	85,500	91,500	73,152	72,000
INVENTORY	173,265	183,979	140,652	96,752	83,252	69,752	74,600	80,600

BOMB, GP, 500 LB, MK82/M64/M78



QUARTER ENDING	30 SEP 65	31 DEC 65	31 MAR 66	30 JUN 66	30 SEP 66	31 DEC 66	31 MAR 67	30 JUN 67
ACQUISITIONS	6,549	18,593	45,300	98,300	216,700	240,000	259,200	300,000
EXPENDITURES	22,929	70,206	88,897	72,760	160,775	222,350	225,591	225,591
INVENTORY	137,073	85,460	41,863	67,403	123,328	140,978	174,587	248,996

BOMB, DEMO, 750 LB, M117



QUARTER ENDING	30 SEP 65	31 DEC 65	31 MAR 66	30 JUN 66	30 SEP 66	31 DEC 66	31 MAR 67	30 JUN 67
ACQUISITIONS	0	0	5,570	0	12,500	91,000	225,000	204,552
EXPENDITURES	75,644	87,498	72,566	77,408	6,000	32,150	156,750	156,750
INVENTORY	274,863	187,365	120,369	42,961	49,461	108,311	176,561	224,363

GLOSSARY

AFLC	Air Force Logistics Command
AFRes	Air Force Reserve
AFSC	Air Force Systems Command
AMA	Air Materiel Area
AMC	Air Materiel Command
ANG	Air National Guard
BOD	Beneficial Occupancy Date
CINCPAC	Commander-in-Chief, Pacific
CINCPACAF	Commander-in-Chief, Pacific Air Forces
COMUSMACV	Commander, United States Military Assistance Command, Vietnam
CONUS	Continental United States
DOD	Department of Defense
ECM	Electronic Countermeasure
FEALOGFOR	Far East Air Logistic Force
FEAMCOM	Far East Air Materiel Command
JCS	Joint Chiefs of Staff
JTB	Joint Transportation Board
LATAF	Logistics Activation Task Force
MAC	Military Airlift Command
MACTHAI	Military Assistance Command, Thailand
MACV	Military Assistance Command, Vietnam
MAP	Military Assistance Program

MATS	Military Air Transport Service
MOSPAKS	Mobile Spares and Spare Part Kits
NATO	North Atlantic Treaty Organization
NORS	Not Operationally Ready, Supply
NSC	National Security Council
OICC	Officer In Charge Of Construction
OSD	Office of the Secretary of Defense
PACAF	Pacific Air Forces
POL	Petroleum, Oil and Lubricants
Prime BEEF	Base Engineering Emergency Force
QOR's	Qualitative Operational Requirements
RASS	Rapid Area Supply Support
RED HORSE	Rapid Engineer Deployment-Heavy Operational Repair Squadrons, Engineering
RTAF	Royal Thai Air Force
RVN	Republic of Vietnam
SEA	Southeast Asia
SEALRS	Southeast Asia Logistic Requirements
SEAOR's	Southeast Asia Operational Requirements
SLAT	Strategic Logistic Assets-Thailand
STAR	Speed Through Aerial Resupply
TAC	Tactical Air Command
USAFE	United States Air Forces in Europe
VC	Viet Cong
WG	Wartime Guidance
WR	Wartime Requirements
WRM	War Readiness Materiel
WRSK's	War Readiness Spare Kits

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