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UNITED STATES AIR FORCE OPERATIONS IN THE KOREAN CONFLICT

1 November 1950 - 30 June 1952

1 JULY 1955

Prepared by the USAF
Historical Division
Air University
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DEPARTMENT OF THE AIR FORCE

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Errata Sheet

Page 153, first column, second paragraph, lines 21–22: "Mamsi-dong" should read "Namsi-dong."

Page 253, first column, last line: "6143d Wing" should read "2143d Wing."

Page 254, second column, line 4: "6143d Wing" should read "2143d Wing."

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FOREWORD

This monograph is a successor in point of time coverage to AHS–71, U.S. Air Force Operations in the Korean Conflict, 25 June–1 November 1950. It begins roughly at the end of October 1950, a time at which the United Nations Command was rapidly concluding the victory over the remnants of the North Korean Peoples' Army while, north of the Yalu, there were signs of increasing consequence that the Chinese Communist Forces were going to intervene in Korea. The end of June 1952, when the Far East Air Forces turned its emphasis from tactical or quasi-tactical operations against the Chinese Communists and instituted PRESSURE operations against the Communist regime in North Korea, furnishes a convenient terminal to the present study. A third monograph (AHS–127), yet to be written in this series, will trace USAF operations in the Korean conflict in the period between 30 June 1952 and the conclusion of a cease-fire on 27 July 1953. All of these monographs are conceived as operational histories, with no more consideration for administrative and logistical problems than is necessary to understand the employment of air units in combat.

Since no historical study can be stronger than its sources, a word about reference materials utilized is in order. Great use has been made of the semi-annual histories and historical data submitted in compliance with USAF Regulation 210–3 by the Far East Air Forces, Fifth Air Force, Far East Air Materiel Command [later Far East Air Logistics Force], the Far East Air Forces Bomber Command (Provisional), and the Far East Air Forces Combat Cargo Command (Provisional) [later the 315th Air Division (Combat Cargo)]. These historical reports are accompanied by selected supporting documents, which generally prove to be of especial value. In addition to these headquarters reports much use has been made of wing, group, and squadron historical data; these lower units provide in their histories a rich file of operational information. In addition to these historical sources, research has been conducted in the central files of the Deputy Chief of Staff, Operations, USAF, and in the extensive files of the office known during 1952 as the Korean Evaluation Group, USAF. Many additional reports on special subjects were found at the Air University Library and in the files of the Evaluation Staff, Air War College Although the definitive FEAF Report on the Korean War, issued in two volumes in 1954, became available at a date too late to permit extensive use in the preparation of this monograph, use was made of many of the manuscript sections of this report prior to its publication.

As is the case in all historical monographs, only a small part of the vast store of information included in the command and unit histories of FEAF could be incorporated in this study. All of these histories,

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however, are on file in the Archives Branch, USAF Historical Division, Research Studies Institute, Air University, and it is the desire of that unit to invite the widest possible use of these documents. Within limits, the Historical Division is also prepared to furnish brief special studies on topics of interest within the USAF. It must be emphasized that the historical materials can furnish much information of value to most agencies of the USAF having an interest in the Korean conflict.

This monograph was prepared by Dr. Robert F. Futrell of the USAF Historical Division Although it has been reviewed by the USAF Directorate of Operations, the FEAF, the Fifth Air Force, and the Tactical Air Command, and the comments of these reviewers have resulted in clarifications and substantial improvements in the text, the policy of the USAF Historical Division is to welcome any other criticisms and comments which may be of additional value in revising its historical monographs. Since this study has been written at a fairly early date after the events, the Historical Division by no means considers that the historical record is closed. Additional criticisms and comments by any reader will remain valuable.

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Chapter 1

ADVANCE AND RETREAT IN NORTH KOREA

After a summer of hard fighting in South Korea, the landing of United Nations troops at Inchon in September 1950 to outward appearances precipitated an immediate collapse of Communist aggression. General of the Army Douglas MacArthur, CINC United Nations Command/Far East Command, reported to the United Nations: "The seizure of the heart of the enemy's distributing system in the Seoul area has completely dislocated his logistical supply to his forces in South Korea and has quickly resulted in their disintegration."[1] By attributing the collapse of the North Korean Peoples' Army (NKPA) to a surface maneuver which had placed the U.S. X Corps at the rear of Communist forces, the UNC missed the real lesson of the Korean fighting which was: UN air power, although hedged in by politico-military restrictions and principally employed by the FEC in a manner which did not permit maximum achievement of its capabilities, had been decisive in South Korea. Failure of the UNC to perceive this lesson would result in disaster to the UN cause when its ground troops moved into North Korea

From the beginning of the Korean conflict on 25 June 1950, General MacArthur had seen fit to fight the battles in South Korea along traditional surface warfare concepts, despite his recognition of the fact that his army forces were the weakest of the three military service components of the FEC—army, air, and navy forces. Throughout the summer of 1950 UN ground forces were always opposed by superior numbers of Communist ground troops; fed piecemeal into the battle zone, the Eighth Army was hard pressed to defend itself and took heavy casualties as a result. In view of the facts presented in an earlier study,* it is evident that the UNC's strongest weapon—its air power—was not employed to maximum advantage because it had to be primarily devoted to the close support of the ground forces, the UNC's weakest weapon.

The experience of World War II had shown that tactical air power is employed at maximum advantage when it operates in coordination and cooperation as a coequal of army and naval forces. Drawing upon the wealth of experience in this global war, General Hoyt S. Vandenberg, USAF chief of staff, succinctly stated the most efficient employment of air power in cooperation and coequality with ground forces in these words.[2]

> The proper way to use air power is initially to stop the flow of supplies and ammunition, guns, equipment of all types, at its source.
>
> The next most efficient way is to knock it out along the road before it reaches the front line.
>
> The least efficient way is after it gets dug in at the front line
>
> Nevertheless, there are requirements constantly where the utilization of air power in close support is necessary

This simple schedule, predicated upon a previous establishment of a working air superiority, permitted the maximum effectiveness of tactical air power against a hostile military force. It was not followed in South Korea: when the U S. Eighth Army, committed to action piecemeal and without a long-range campaign plan, found itself retreating south-

*AHS-71, United States Air Force Operations in the Korean Conflict, 25 June-1 November 1950

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ward in a "critical" situation, FEAF was directed to employ its aerial predominance in close support of ground units to the exclusion of all else. Had not Lt. Gen. George E. Stratemeyer, the FEAF commander, and his able vice commander, Maj. Gen. O. P. Weyland, finally persuaded the CINCFE staff that curtailing the forward flow of Communist troops and materiel was essential to the war effort, the Eighth Army might never have recovered from its "critical" situation. As it was, only a part of the FEAF effort could be given to strikes at the rear of Red forces; the majority remained committed to battle line support.

The experience of World War II had also demonstrated that air and ground forces deserve cooperative but withal common and independent missions against the enemy military machine. As received from CINCFE, however, the FEAF mission revealed a conception that ground forces were decisive: the FEAF mission required it to: "Conduct air operations as a part of the United Nations Command, to assist in the destruction of North Korean military forces." [3] This statement of mission prevailed from the initiation of Korean hostilities and would not be changed until June 1952.

Viewing air power as a supporting force to the surface battle, the FEC not unnaturally ignored the advantages to be derived from a unified control which permits the maximum exploitation of the full capabilities of the air weapon. The FEC never provided such a unified control of its total air capability, other than a somewhat vague arrangement which it chose to call "coordination control."* At the initiation of the Inchon amphibious operation, moreover, the air capability of the FEC was frankly compartmented: the Eighth Army was supported by the Fifth Air Force and the X Corps was assigned the 1st Marine Air Wing as an integral supporting air command. General MacArthur, in fact, reported with some pride that the two ground forces were "completely self-sustaining." [4]

*See Chap III, pp. 74–78

In the fighting in Korea during the summer of 1950 the FEC had thus violated the principles established during World War II, principles which contemplated the employment of tactical air power as a coordinate equal with land power.

Certain other politico-military limitations imposed by the U.S. Joint Chiefs of Staff and necessarily accepted by the FEC/UNC as ground rules for the conduct of the war prevented the maximum exploitation of available air power. Chief of these restrictions was that CINCFE had to exercise particular care that UN aircraft did not violate Soviet or Chinese territory or territorial waters, a restriction which was further elaborated to restrict aerial bombardment of targets lying within five miles of the North Korean border.[5] Although the FEAF successfully destroyed Communist war production facilities within North Korea it could not touch the source of the vast majority of Communist munitions and supplies lying beyond the Yalu River boundary; it was consequently unable "to stop the flow of supplies and ammunition, guns, equipment of all types, at its source."

Politico-military considerations also hampered the demonstrated ability of air power to produce emotional or psychological responses in the peoples and the ruling regimes of enemy nations. When Maj. Gen. Emmett O'Donnell, Jr., reached the Far East with the first two of four Strategic Air Command (SAC) medium bombardment groups which would comprise the main strength of the FEAF Bomber Command, he had great hopes for obtaining the psychological gains possible with air power:[6]

> It was my intention and hope, not having any instructions, that we would be able to get out there and to cash in on our psychological advantage in having gotten into the theater and into the war so fast, by putting a very severe blow on the North Koreans, with advanced warning . . telling them that they had gone too far in what we all recognized as being an act of aggression . .
>
> I thought that [pre-strike warnings] would take care of the humane aspects of the problem. We thought we could do it Tell them to either stop the aggression and get back over the thirty-

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eighth parallel or they better have their wives and children and bedrolls to go down with them because there is not going to be anything left up in North Korea to return to.

Apprehensive of adverse world-wide, and especially Asiatic, reactions the JCS did not approve psychological air attacks, and in fact would not initially permit the use of the most effective incendiary munitions which FEAF had planned to employ against North Korean war-making production.

Although hedged by political restrictions which had to be accepted as ground rules and principally employed by the FEC/UNC in a manner which did not permit the maximum achievement of its capabilities, UN air power was nevertheless decisive in Korea during the summer of 1950. Whenever they could cajole or persuade the FEC staff to permit it, Generals Stratemeyer and Weyland had properly employed a part of FEAF's efforts in the manner prescribed in tactical air doctrine. Whenever possible they had struck the Korean Red armies in their vulnerable rear areas, with the result that by the time of the somewhat anticlimatic amphibious maneuver at Inchon, the NKPA in South Korea had been reduced to a hollow shell of desperately struggling resistance around the Pusan perimeter

With constant diversions of most of the effort to close support of the Eighth Army, the pattern of air operations which paid the great dividends was as follows: First of all, UN air had established air superiority over Korea by the destruction of the small North Korean air force, not a difficult task under the existing circumstances but once accomplished it paid large dividends. Friendly air superiority meant that UN ground forces were permitted the utmost freedom of movement while the enemy, under constant air attack, had to move and fight at night. What portion of the FEAF force could be retrieved from providing close support was utilized in interdiction and armed reconnaissance attacks to the rear of the NKPA. These attacks reduced the enemy's forward flow of supplies from a 206 ton daily average in early July 1950 to a mere 21 5 tons during the period of the Pusan perimeter defense. North Korean armor, which had spear-headed the initial Communist drive, was knocked out by air action, many of the tanks being destroyed before they could get into action. on his way to North Korea in the summer of 1950 the captive Maj. Gen. W. F. Dean noticed that "all up and down the highway a remarkable number of tanks had been knocked out by aerial action."[7] North Korean prisoners of war estimated that air action had destroyed over 70 per cent of their tanks, trucks, and artillery pieces, and, what was more surprising, they estimated that UN air assault had killed over 49,000 North Korean troops, or 47 per cent of all Communist soldiers killed in the fighting in South Korea.[8]

Cut off from his source of supply, his equipment being destroyed and his personnel slaughtered by air action, the North Korean enemy plainly was sustaining his last weeks of vicious attacks against the Pusan perimeter by sheer desperation. Attacks against the U.S. 2d Division on 9 September 1950, for example, were in five waves· the first three waves were armed and the last two were sent into the battlefield unarmed, with orders to secure their weapons from the dead and dying there. By 15 September 1950 such NKPA power as remained was merely an encrustation around the Eighth Army's defensive perimeter, and no more than a few Red security troops were posted in the rearward areas.

That decisive UN air action against the enemy's rear had reduced the NKPA to circumstances preventing it from long continuing effective military operations was generally overlooked, and the X Corps' encircling maneuver at Inchon was credited with breaking the back of the North Korean forces. For men indoctrinated in surface strategies it was not peculiar that they could not completely credit the decisiveness of air action in areas too remote for them to see the damages General MacArthur's own view was that: "The air alone has certain limitations as compared with ground troops. . . The air covers an enormous area of ground. The casualties that it imposes on the enemy are

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heavy and accumulative, but they are scattered. An airplane hits here, another airplane would hit over here, another airplane would hit over here. So the accumulative casualties are heavy, but they do not hit in any concentrated area. . . . It is quite evident to anybody that is acquainted with war that determined ground troops cannot be stopped alone by air." [9]

Thinking in such fashion, General MacArthur outlined a strategy for the occupation of North Korea which placed great emphasis upon surface maneuver. The decision to press forward to the Yalu with a ground strategy ignored the contributions of air power to the victory in Korea and it refused to recognize the fact that as UN supply lines grew longer and longer there would be increasingly diminished opportunities for UN air employment until at last the UN ground troops would be faced with a new and fresh opponent, who, because of the political restriction curtailing air operations at the Yalu, would have been untouched by aerial attacks. The UNC strategy not only ignored the lesson that decisive air action had paved the road for ground advances in South Korea but now there were intimations, most markedly manifest in the assignments of service priorities for transportation, that not too much would be expected of UN air power during the exploitative ground operations in North Korea The surface strategy once again intended to exploit the UN ground forces, the weakest of UN elements, and to negate the advantages obtainable through the use of air power, the UNC's strongest weapon.

FEC CONCEPT OF OPERATIONS IN NORTH KOREA

Estimates of Chinese Communist Intentions: In the summer of 1950, FEC intelligence had not been blind to the "sinister connotations" of Red Chinese troop strength in Manchuria, which had grown from some 116,000 regulars on 8 July to some 850,000 troops of all description by 16 November 1950. Much of this troop strength represented General Lin Piao's Fourth Field Army, which had previously been transferred south to participate in an invasion of Formosa and, with Formosa postponed, was now probably being returned to its home stations. FEC intelligence could thus conclude: "Actually, this growth of strength in Manchuria was not an immediate index of warlike intentions." [10] Prior to the initiation of the Korean hostilities the Chinese had nevertheless furnished a number of their units for integration into the NKPA, and on 4 October 1950 Washington warned MacArthur that "the potential exists for Chinese Communist forces to openly intervene in the Korean war if UN forces cross the 38th parallel." [11] At about this same time Communist Premier Chou En-lai stated over the Peiping radio that the Chinese people "would not stand supinely by while their neighbor was being invaded." [12]

In reply to a specific question put by President Truman at Wake Island on 15 October 1950, MacArthur saw very little chance that the Chinese would interfere with UN operations in North Korea. Had the Chinese intervened during the first or second months of the Korean fighting, MacArthur thought that such would have been decisive, but in October he no longer feared Chinese intervention: in his estimation there were only some 300,000 Chinese troops in Manchuria, of which probably no more than 125,000 were distributed along the Yalu River MacArthur thought that not more than 60,000 Chinese troops could be gotten across the Yalu if they did decide to intervene, and since he believed that the Chinese had no air force he expected that "if the Chinese tried to get down to Pyongyang there would be the greatest slaughter." The only resistance remaining in North Korea was about 100,000 Korean replacements, who were "poorly trained, led and equipped, [and who were] . . . fighting only to save face." [13]

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Initiation of UN Ground Operations in North Korea: Since the North Korean regime appeared to be tottering, General Stratemeyer on 27 September advised General MacArthur that FEAF could perhaps hasten the process and clean out the remaining important military targets in the Pyongyang area with a 100 B–29 mass strike While MacArthur approved the idea, he requested Stratemeyer to hold the attack in abeyance until he had formally offered surrender terms to the Red Koreans, as he was directed at this juncture to do by order from Washington Both MacArthur and Stratemeyer saw no reason why such a mass attack against military objectives could not be undertaken under the current FEC directives, but even before MacArthur could issue his surrender ultimatum a flash message came in from the JCS requiring that any all-out bombing attack to be delivered against Pyongyang be referred to the JCS for consideration by higher authority before it was implemented [14]

Having broadcast a message to the commander of the NKPA on 1 October, calling upon him to cease resistance, liberate prisoners and internees, and receive the civilized care accorded to all prisoners by the UN forces, General MacArthur on 2 October issued orders for a ground operation into North Korea. The Eighth Army was directed to move northward along the Kaesong-Sariwon-Pyongyang axis, while the X Corps, loading out of South Korean ports, was directed to make an amphibious landing at the east coast city of Wonsan, whence it was to force its way across the Korean peninsula to Pyongyang. Once again as had been the case at Inchon, the FEC ordered a command arrangement which divided its air capabilities: the X Corps amphibious landing was to be supported by fast carrier air and by the 1st Marine Air Wing. When the 1st Marine Air Wing could get ashore at Wonsan area airfields, moreover, the FEC apparently intended that it would remain under the command of the X Corps. General Weyland promptly protested this arrangement as a violation of "coordination control" and CINCFE issued a supplemental order providing for the dissestablishment of the Wonsan objective area as soon as elements of the X Corps passed beyond its designated boundaries, at which time the Fifth Air Force was to assume "coordination control" responsibilities for all land-based air operations in Korea The FEAF was directed to support the advance of the Eighth Army (the Fifth Air Force being sub-delegated as the activity which would provide the close air support for this army), to support the landing and subsequent operations of the X Corps as directed, and to be prepared on four days' notice to drop the 187th Airborne Regimental Combat Team where and when it was needed.[15]

Having had no reply from his ultimatum and being now specifically authorized to cross the 38th parallel by a UN Assembly resolution of 6 October, General MacArthur launched the Eighth Army attack northward on 7 October. In its initial thrust the Eighth Army employed only two U.S. Divisions (the 1st Cavalry as the spearhead and the 24th Infantry) and four ROK divisions, all being lightly loaded for rapidity of movement. With the Fifth Air Force guarding and breaking up enemy resistance on the flanks, the Eighth Army drive met no real enemy resistance until it reached the town of Hukkyori, about 10 miles south of Pyongyang Here the enemy had collected about 25 tanks, 8 self-propelled guns, and several heavy mortars, but in an all-day action combining fighter-bomber strikes and friendly tank fire this resistance was successfully neutralized.[16] The 1st Cavalry Division, reinforced by the British Commonwealth 27 Brigade, drove into Pyongyang on 19 October "The break-through at Hukkyori and the subsequent capture of Pyongyang . . . by this Division," wrote Maj. Gen Hobart R. Gay, in command of the 1st Cavalry, "was made possible only by the magnificent close air support given by the Fifth Air Force."[17] On 20 October the FEAF Combat Cargo Command dropped the 187th RCT astride the main communications routes about 30 miles north of Pyongyang, near the villages of Sukchon and Sunchon, a successful maneuver in which an estimated 2,764 North Korean

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troops were killed and an additional 3,000 captured.[18]

That same day—20 October—the X Corps was due to come ashore at Wonsan, but unanticipated mine fields were going to hold up its landings until 26 October. Actually, however, Wonsan had long since fallen to Republic of Korea (ROK) forces which had driven north overland with Fifth Air Force and Marine fighter-bombers breaking up enemy opposition in their front. The ROK Capitol Division captured Wonsan airfield on 11 October, and two days later Maj. Gen. Earle E. Partridge, commander of the Fifth Air Force, and Maj. Gen. Field Harris, commander of the 1st Marine Air Wing, met there to discuss movement of the Marine air garrison to that place. Thus when the X Corps finally got ashore, its operational area was already disestablished, and the Fifth Air Force exercised "coordination control" over the 1st Marine Air Wing. This arrangement was somewhat embarrassing to General Partridge, since he as commander of the Fifth Air Force was now individually responsible for providing support to two independent ground commands—the Eighth Army and X Corps. If air support requests emanated simultaneously from both ground commanders, Partridge would be placed in the difficult position of having to decide which request was to receive priority, a decision more logically the responsibility of a single commander of all Army operations in Korea. Actually, however, neither the Eighth Army nor the X Corps required great amounts of close air support for several weeks, and when the Chinese Communists attacked Partridge solved the difficulty by directing the 1st Marine Air Wing to assume responsibility for close support of the X Corps, reporting to the Fifth Air Force any requests for support which exceeded that wing's capabilities.[19] After 26 October the X Corps expanded its area of operations on the east coast of Korea against slight opposition.

The cloth of strategy for the FEC occupation of North Korea had been cut by the pattern for a ground campaign With the exception of a small amount of close air support and a great amount of air transport activity, the UN air had a somewhat limited mission. When the Eighth Army indicated that it needed air-delivered motor fuel and rations more than air support, the Fifth Air Force on 22 October voluntarily gave up to that army its assigned share of the FEAF Combat Cargo Command airlift. This action meant that the Fifth Air Force could not move its air units up to captured North Korea airfields and would necessarily limit its air operations at the far northern area of Korea.[20] Since 26 September the JCS had prohibited attacks against strategic targets remaining in North Korea, and the rapidity of the UN sweep northward ruled out any extensive interdiction campaign: on 18 October the B–29's were forbidden to operate south of Sinanju. Because of a great scarcity of targets FEAF early in October reduced Bomber Command to about 25 sorties a day, and on 25 October MacArthur authorized the release of the 22d and 92d Bombardment Groups for return to the United States. Restrictions against violating the Manchurian border were tightened even more: on 17 October armed reconnaissance flights were permitted to attack under visual flight conditions within a 50-mile zone along the border but not closer than a "chop line" connecting Hwatandong-Kanggye-Ounni-Hapsu-Murung-dong-Hadan; only under emergency conditions and with a full report to FEAF could General Partridge authorize missions north of the "chop line" On 25 October close support missions under visual control of ground or air controllers were permitted to go as close to the border as necessary, but pilots for these missions had to be carefully selected for their experience. Only the FEAF Combat Cargo Command was working at its maximum level: By late October it was delivering approximately 1,200 tons daily to Pyongyang, and on two successive days, 24 and 25 October, the Command broke its tonnage records by carrying 1,687 tons on the first day and 1,767 tons on the second. Almost 90 per cent of this total tonnage was delivered to North Korea, the great bulk of it being rations and motor gasoline for the Eighth Army. Lt. Gen. Walton H. Walker, Eighth Army commander stated that "if it were not for our airlift, the Eighth Army would

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be flat on its back and at a standstill, awaiting the opening of ports and rail facilities."[21]

The ground-oriented strategy everywhere in North Korea appeared successful, and already General MacArthur had foreseen the end of formal resistance in Korea by Thanksgiving.[22] But the planning for the operation had ignored the lesson that air power had been decisive in South Korea and had apparently forgotten that the UN ground forces in Korea were the weakest of the three service components. The operations were thus fraught with great potential hazard: UN air power had permitted ground advances in South Korea by destroying the enemy air force, by bleeding enemy troops and supplies before they could reach the battle zone, and by delivering attacks just ahead of UN ground troops; but now, for politico-military reasons, UN air power could not cross the Yalu, and as the battle line approached this international boundary opportunities for air employment decreased and were further curtailed by restrictions designed to prevent border violations. A second hazard was the divided UN field command in Korea: General MacArthur had elected to employ the Eighth Army on the west coast of Korea under General Walker while X Corps operated independently under Maj. Gen. E M. Almond on the eastern side of the Korean mountains (See figure 1.) But the greatest potential hazard was the presence in Manchuria of substantial Chinese Communist forces, including an air force, which had been massing there all summer, untouched by UN air action.

The Chinese Reveal their Intentions: Late in October 1950 a series of hostile demonstrations indicated that the Chinese intended at least to make a limited intervention in Korea. On 24 October Communist antiaircraft guns emplaced to the north of the international border fired on two Marine F4U's while they were from three to five miles south of the boundary; next day, light flak fired across the Yalu River destroyed an F–51 near Sinuiju General Stratemeyer protested the "unwarranted attacks" as a violation of international law, but the attacks by ground fire were continued.[23] Simultaneously with these hostile demonstrations came manifestations of a rejuvenated Communist air force: the crew of a 31st Strategic Reconnaissance Squadron RB–29 reported sighting between 75 and 100 fighter-type aircraft parked on Antung airfield early on the afternoon of 18 October, but when a photographic mission was flown next day, the planes had disappeared and FEAF was inclined to doubt that the enemy would expose so many aircraft at Antung. On the morning of 1 November, however, three Russian-built Yak fighters attacked a T–6 Mosquito and a B–26 near Sinuiju; the B–26 destroyed one Yak, and F–51's were called in to dispatch the other two Communist planes. At about the same time, an F–80 reconnaissance pilot flashed the report that some 16 other Yaks were dispersed at Sinuiju airfield, which was across the river from Antung and had previously been vacant.[24] That afternoon a flight of 12 F–80's found the Yaks still there, and despite revetments and antiaircraft fire the F–80's destroyed 1 Yak and damaged 6 of them, at a cost of 1 F–80 shot down by intense and accurate flak. That same day, F–51's supporting the Eighth Army were bounced by six enemy jet fighters, tentatively identified as MIG–15's.[25]

Hostile swept-wing jet fighters had been reported over Korea as early as July 1950,[26] but the sightings on 1 November were the first definite information that MIG–15's had entered the Korean air war.[27] Estimates based on aerial sightings showed that the enemy mounted approximately 116 sorties during the first week of November, all except 10 by MIG–15's and most of them within 18 to 20 miles of Sinuiju. For the first time during the Korean conflict, enemy counter-air action was met on seven consecutive days; and on 8 November 1950 the first all-jet air battle in history took place between 51st Fighter-Interceptor Wing F–80's and the MIG–15's, resulting in one MIG shot down by Lt. Russell J. Brown and another damaged.[28] On 9 November, however, MIG's attacked an RB–29 which had been crippled by antiaircraft fire and sent it limping home to Johnson Air Base, where a crash landing killed five crewmen; in the running battle the RB–29 tail gunner

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Figure 1

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had shot down one of the MIG's.[29] Next day, MIG–15's pounced on a B–29 lagging behind a 307th Bombardment Group formation, damaged an engine and caused the crew to parachute behind enemy lines.[30] By 11 November, General Stratemeyer computed that the enemy had lost 2 MIG–15's and 16 Yaks in the renewed air offensive,[31] but the action had not been without cost to the UN air effort.

The Communists had chosen to put their MIG–15's into action under the most favorable circumstances. not only were the MIG–15's revealed as superior fighters, but the sanctuary bases in Manchuria permitted them great advantages They particularly harassed the conventional F–51 Mustangs, although these propeller-driven aircraft easily turned inside the MIG's if they could first sight them Initial encounters demonstrated that the MIG–15's were much faster in level flight and could outclimb the F–80's; contacts on 18 November also demonstrated that they were faster, could outclimb, turn inside, and accelerate faster than the U S. Navy's F9F jet fighters. The F–80's chief advantage was maneuverability, and it could destroy a MIG in a turn. Against B–29 aircraft, the MIG was particularly dangerous when striking from 3 to 9 o'clock rear angles.[32] The MIG's tactical plan of attack followed a standard pattern: as UN aircraft approached the Yalu the MIG's would take off from their sanctuary bases, climb to a superior altitude, cross the border, dive on UN aircraft, and then sweep away at low level back into Manchuria, where if their pilots desired the whole process was started again. UN aircraft attempts to lure the MIG's southward away from the border were not successful [33]

Whether or not there had been a large build-up of the North Korean Air Force or whether the MIG's were piloted by Chinese or a Communist "volunteer" air force was not apparent early in November 1950, but the enemy air renaissance was "a formidable factor" FEAF estimated that the Chinese Communist Air Force (CCAF) comprised approximately 300 aircraft (200 fighters, 75 TU–2 bombers, 25 transports). Using these aircraft, the enemy could divert a considerable portion of the UN air effort away from close support of ground action, interfere with the UN airlift to Korea, strike UN naval vessels and installations in Korea, and support North Korean ground actions. There were sufficient air facilities in Manchuria, within combat range of North Korea, to accommodate the CCAF and such additional planes as might be made available by Soviet Russia.[34]

At the end of October 1950 the UN land campaign appeared to be progressing favorably against the remnants of the NKPA. But beginning with small groups of troops which crossed the Yalu on 14 to 16 October, the Chinese by 26 October had moved their Thirty-eighth, Thirty-ninth, and Forty-second armies into North Korea Later captured Chinese documents fixed 25 October 1950 as the initial date of the first Chinese campaign in Korea [35] UN intelligence began picking up reports of Chinese divisions in the forward areas, and stronger resistance was developing against ROK troops in the northwest, with heavy fighting near Chosan, Unsan, and Tokchon. By 30 October the Eighth Army had captured 10 Chinese fighting with NKPA units, but it had no concrete evidence of any outright commitment of Chinese units.[36] On 2 November, however, a Communist attack near Unsan penetrated and encircled the U.S. 8th Cavalry Regiment In the face of continued intensive enemy attacks, probably now supported by CCF troops, General Walker on 3 November 1950 ordered the bulk of his Eighth Army withdrawn to the south bank of the Chongchon River to regroup and accumulate supplies.[37]

Despite these increasing evidences of Chinese intervention, General MacArthur professed an inability correctly to appraise the situation on 4 November. He noted four possibilities. 1) that the Chinese Communist government intended to intervene with full military force at a time it deemed appropriate; 2) that it would covertly give military assistance but conceal it for diplomatic reasons; 3) that it would permit and abet a flow of "voluntary" personnel to aid the North Koreans; and 4) that it might have intervened in the mistaken belief that only ROK units would be sent to the Yalu, units which might

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be insufficient for the purpose. MacArthur found the first contingency opposed by "fundamental logical reasons" and unsupported by enough evidence; the last three contingencies, or a combination of them, seemed more likely.[38] MacArthur nevertheless felt it necessary to bring a listing of such hostile activities of the Chinese to the notice of the United Nations.[39] From Taipei, Formosa, however, Col. LeRoy G. Heston, the air attache, warned that a very high Kuomintang official said that the UN forces were "in grave danger" from an all-out Chinese Communist effort.[40] And by mid-November, FEC intelligence was disseminating reports that troops of both the Third and Fourth Chinese Communist Field Armies were moving into Manchuria, but it still seemed doubtful that the Chinese would have waited so late to intervene in the Korean war had they so intended.[41]

UNC PREPARATIONS FOR A RENEWED DRIVE TO THE YALU

The Fifth Air Force Moves North: During the latter part of September and October most of the fighter units of the Fifth Air Force in Korea had moved to recaptured and hastily rehabilitated airfields south of the 38th parallel, so that by 1 November these units occupied position as shown in figure 2. The 18th Fighter-Bomber Group had moved its two F–51 squadrons to Pusan airfield (K–9) on 7 September. The 49th Fighter-Bomber Group had all three of its F–80 jet squadrons at Taegu (K–2) by 1 October, air echelons having begun operations from the base on 28 September. On 8 October, the 543d Tactical Support Group with its 8th Tactical Reconnaissance Squadron (RF–80 photo jets) and 162d Tactical Reconnaissance Squadron (RB–26 night photo aircraft) began to operate from Taegu airfield Advance elements of the 35th Fighter-Interceptor Group moved to Pohang (K–3) on 3 October, and on 7 October the group was settled there with its 39th and 40th Squadrons The RAAF 77 Squadron, also an F–51 unit, joined the 35th Group on 12 October. The 8th Fighter-Bomber Group with its 35th Squadron reached Suwon airfield (K–13) on 7 October, but it soon found the facilities there too badly destroyed to maintain operations of their F–51's; on 30 October the 8th Group therefore moved to Kimpo (K–14), where it was joined by its other squadron, the 36th from Tsuiki Advance personnel of the 51st Fighter-Interceptor Wing reached Kimpo on 12 October, and by 25 October the F–80 squadrons of the 51st Group (together with the attached 80th Squadron of the 8th Group) were in place With the exception of Kimpo, where the 51st Wing provided base services, the Fifth Air Force utilized provisional table-of-distribution wings at its fields in Korea. Thus the 6150th Tactical Support Wing manned Pohang, the 6002d served Pusan, the 6131st was at Suwon, and the 6149th based at Taegu.[42]

Making its movement northward from Taegu as soon as transportation permitted, Headquarters, Fifth Air Force in Korea opened in Seoul on 15 October. The agencies whereby tactical aviation was controlled—the Joint Operations Center (JOC) and the Tactical Air Control Center (TACC)— opened there the same day. The 502d Tactical Control Group, getting into action at about this time, furnished a regular establishment for the tactical air control system as it centered in Seoul. One squadron of the group manned the TACC, and the other three manned Tactical Air Direction Centers (TADC's) at Kimpo, Taegu, and Taejon. These TADC's merely provided early warning and direction-finding facilities and did not enter into the control systems for offensive fighter direction.[43] The Fifth Air Force, moreover, had taken most of its point-to-point communications equipment away from the 502d Group in order to provide badly needed communications between the TACC and the outlying airfields in Korea.[44]

In view of the fact that the Eighth Army and X Corps had been accorded the first claim in the allocation of scarce surface transportation, the build-up of the Fifth Air Force in South Korea had been delayed. When the

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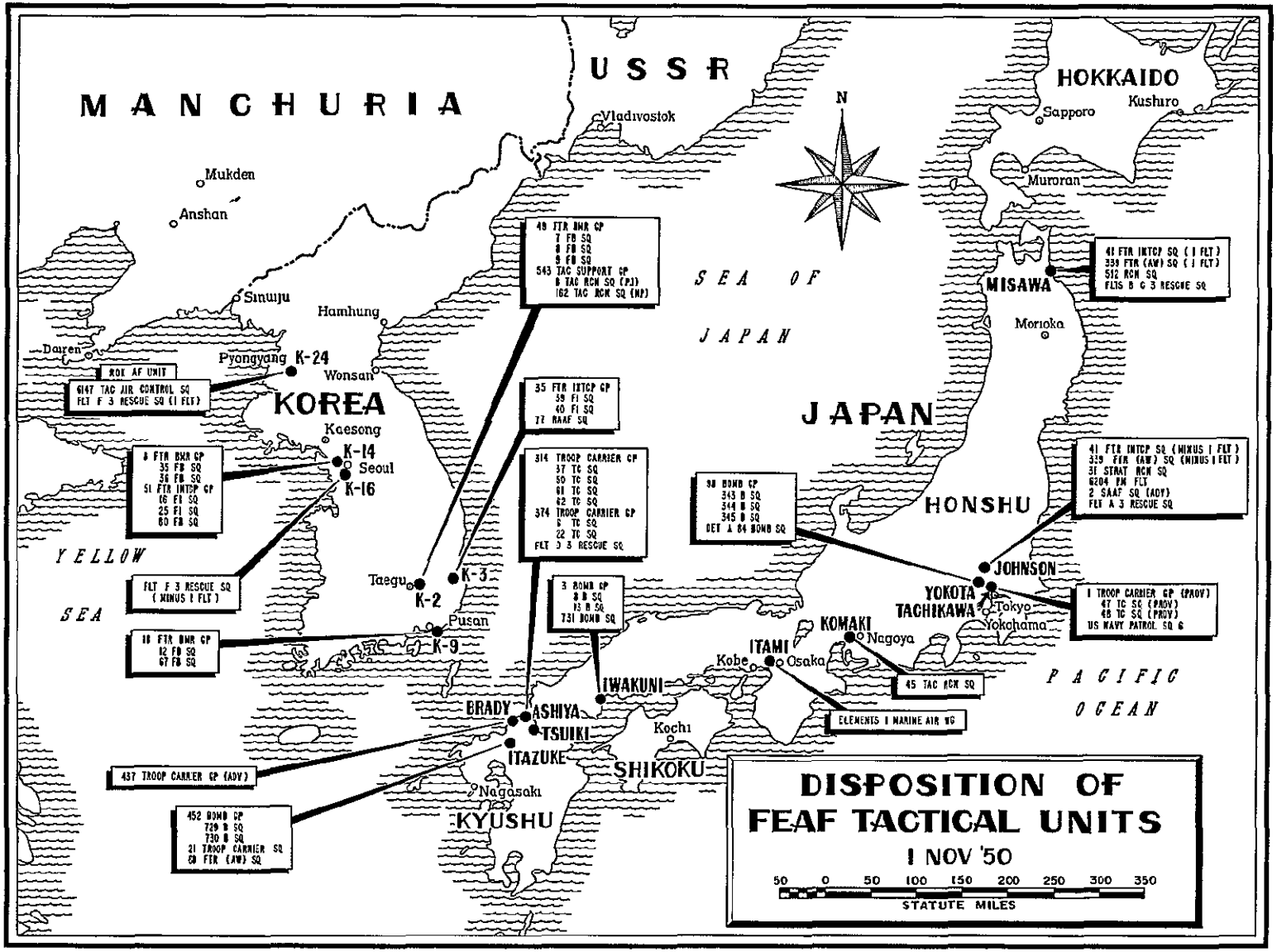


Figure 2

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X Corps outloaded through Inchon for amphibious movement to Wonsan, delays of as much as three weeks in unloading Air Force equipment were not uncommon. For example, two transports and a victory ship carrying cargo for the 6131st Wing arrived at Inchon on 10 October, the transports began unloading on 23 and 25 October, and the unloading of the victory ship was not undertaken until early November. Part of the 8th Group's equipment which lay buried in the hold of a cargo vessel off Inchon during October was finally unloaded only after the ship moved back to Pusan, whence the equipment was hauled back overland by rail and truck. Symptomatic of the effect of this delay upon air operations is the 6131st Wing estimate that its operations were no more than 35 per cent effective during the period in which it waited for heavy equipment.[45]

This same shortage of transportation had prevented the movement of Fifth Air Force tactical units into North Korea. A combination of factors including the havoc which had been wrought upon Korean transportation facilities by air interdiction programs, heavily mined harbors and beaches, continuous rear-area activity by Red guerrillas who tore up rail lines and ambushed trains and truck convoys, and ice and snow on one-way roads through the mountains fairly well limited supply in North Korea at the end of October to one method of transportation—air transport. Due to its critical need for supplies, General Partridge on 22 October had agreed to release to the Eighth Army for a two weeks' period nearly all of the Fifth Air Force's normal airlift allocation, retaining only some 60 tons per day, an amount sufficient to supply no more than a few air base units, the Mosquito squadron, and an air rescue detachment at North Korean airfields.[46] Fifth Air Force units in North Korea on 1 November were small base service organizations providing logistic support for limited operations at Pyongyang (K–23), Pyongyang East (K–24), and Yonpo (K–27) airfields: the 6148th, 6146th, and 6151st Air Base Units, respectively. The 6147th Tactical Air Control Squadron and Detachment F, 3d Air Rescue Squadron were at Pyongyang East (K–24) In accordance with his agreement with the Eighth Army, General Partridge had held movement of air units into North Korea to the minimum.

Early in November, however, General Partridge quickly and accurately assessed the true meaning of the sudden resistance to Eighth Army progress and of the appearance of the MIG–15's· the enemy opposition revealed to him strength and capabilities which were possible only with fresh troops in organized and well-equipped units. Until the full extent of Chinese intervention was revealed, Partridge announced that his air force had to prepare for a conflict of indefinite duration. To check the depredations of the MIG's and to safeguard UN troops against air attack, he had to move Mustang air groups northward where they could operate more effectively, institute air patrols over Sinuiju, and open an aircraft warning radar closer to the front lines.[47] The only difficulty was that this deployment would require air transport, and General Walker, wishing to complete his logistics build-up as soon as possible, indicated that the Eighth Army not only wished to retain the Fifth Air Force share of the air transport capability but to obtain that portion of the capability which had been going into Wonsan for the X Corps—in short General Walker stated that the Eighth Army required the entire 1,000 tons per day capacity of the FEAF Combat Cargo Command.[48]

During September and October 1950, air transportation had been so generously furnished that it had been used for many routine tasks rather than being conserved for genuine emergencies. Now the FEAF Combat Cargo Command (P) faced a dilemma: the Fifth Air Force needed to recapture its air supply priority and to build up the tempo of its tactical air operations at airfields being used by transport aircraft. To expand the Korean airlift, Maj. Gen. William H. Tunner, commander of the FEAF Combat Cargo Command, would require expanded facilities at the same Korean bases which the Fifth Air Force needed[49] General Tunner's staff explained these problems to General Strate-

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meyer, who, after study, announced his decision. It appeared inevitable to him that the shortage of suitable airfields in central and northern Korea would result in competition for them, but he ruled that the sudden increase in quality and quantity of the enemy air opposition demanded that the Fifth Air Force be given priority in the occupancy and use of the fields and that Cargo Command would limit its activities at these fields to such transport aircraft as were necessary to airlift emergency supplies and equipment. It was also evident to Stratemeyer that Fifth Air Force, Eighth Army, and X Corps were going to compete for the scarce air transport capacity, but he suggested that consideration be given to the fact that the Eighth Army was opening rail traffic into Pyongyang and port facilities at Haeju and Chinnampo and that X Corps had a growing ability to use cargo-handling facilities at the east Korean coastal ports of Wonsan and Iwon. Combat Cargo Command would therefore lend all possible assistance to the forward movement and resupply of Fifth Air Force combat units [50]

General Stratemeyer's order gave Tunner a temporary responsibility of inquiring into the degree of urgency of supplies carried by air, a responsibility which was normally handled by a theater priority board, and when he investigated closely it appeared possible to divert some air-carried supplies to surface transport: Eighth Army maintained that 1,000 tons a day constituted its legitimate emergency request, but the X Corps agreed to reduce its requirement by canceling air delivery of motor gasoline to Wonsan.* On 10 November FEAF secured the issuance of a CINCFE directive properly emphasizing that daily airlift requirements had to be limited to emergency supplies which could not be moved by other means of transport.[51] Under this directive the Eighth Army and X Corps were expected to depend increasingly upon surface and water transportation. With some reinforcements from the United States,* and a firm understanding that air transport was a limited quantity, the FEAF Combat Cargo Command proved able to handle legitimate emergency requests. (See figure 3.)

As quickly as he could get transportation, General Partridge began moving the Fifth Air Force north of the 38th parallel. In a combined air and surface movement the 605th Aircraft Control and Warning Squadron moved its radars to a site near Sinanju airfield (K–29) and began operating on 21 November. Mustang units went northward as quickly as captured airfields were readied. Between 10 and 19 November the 6150th Tactical Support Wing moved from Pohang to Yonpo airfield (K–27), an airfield on the east coast of Korea a few miles south of Hamhung. The tactical elements, the 35th Fighter-Bomber Group and the RAAF 77 Squadron, remained at Pohang until the wing was in place, but between 17 and 19 November sorties took off at Pohang, made their strikes, and landed at Yonpo, thereby completing the movement of the entire wing.[52] On 22 November the 6002d Tactical Support Wing, the 18th Fighter-Bomber Group, and the South African Air Force 2 Squadron were in place at Pyongyang East (K–24), but many of the 18th Group's Mustangs had been staging through the field for some days prior to the formal change of station.[53] Beginning on 7 November an echelon of the 6131st Tactical Support Wing was sent to Pyongyang airfield (K–23), and the main body began moving on 25 November; the 8th Fighter-Bomber Group completed movement of its two F–51 squadrons to K–23 on 25 November.[54] Most of the movements were expeditiously accomplished by air, although heavier equipment for the units from Kimpo went by water to Chinnampo and vehicles were driven overland in convoy.

These November movements placed eight Mustang squadrons north of the 38th parallel where they were within a more advantageous

*On 21 November 1950, however, General Almond requested assignment of six of the critically short C-47's to the operational control of X Corps with station at Yonpo airfield (K-27), these planes to be on hand for supply drops during sudden breaks in the weather FEAF refused the request with the observation that it could not afford to tie up transports when it was already unable to meet all emergency requests from using agencies. (Msg A-3735-B, CG FEAF to CG Combat Cargo Command, 21 Nov 1950)

**See* pp 16–17.

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DISTRIBUTION OF AIRLIFT TONNAGE

FEAF Combat Cargo Command

November 1950

Date	8th Army	5th AF	X Corps	All Services	Total
1	1,016 6	117.1	148 2	503.5	1,785 4
2	751.6	101.0	229 9	347 5	1,430.0
3	850 1	100.3	214.6	184 9	1,349.9
4	467 9	80 1	123.2		671.2
5	880 6	86 5	107 2	439 1	1,513 4
6	860 0	62 1	100 3		1,022.4
7	925 6	285 5	32 0	56 3	1,299 4
8	906 4	199.2	44 2	390.8	1,540 6
9	750 5	340.7	54 1	146.7	1,292 0
10	322.3	419.5	42.4	305 5	1,089 7
11	685 1	378.1	5 9	78.6	1,147.7
12	576.9	334 7	13 6	97.0	1,022 2
13	558.6	356.1	12 2	252 4	1,179 3
14	603 2	290 1	27 1	14 1	934 5
15	564 6	392.4	4.3	367 1	1,328 4
16	536 8	352.8	17 9	213 4	1,120 9
17	317.7	678.7		178 5	1,174 9
18	252.9	535 1	11 0	230 8	1,029 8
19	231 3	578 8	15.6	230 4	1,056 1
20	336 0	413 8	163 0	275 9	1,188 7
21	301.0	610.2	29 7	271 6	1,212.5
22	347.0	486.5	130 7	186 2	1,150 4
23	267.1	516 0	113 6	205 9	1,102 6
24	350 8	379 5	88.7	133 4	952 4
25	348 3	400.9	20 0	235 8	1,005 0
26	670 3	273.4	15.7	273.2	1,232 6
27	556.8	148.9	24 7	312.2	1,042 6
28	580.8	279.4	8 4	359 4	1,228 0
29	315 4	91.6	92.4	276 0	775 4
30	247.5	150 1	114 3	615 2	1,127.1

Figure 3

range of the battle line. (See figure 4.) While flying missions from Pusan (K–9) early in November, for example, the 18th Group's Mustangs had trouble reaching the bomb line, finding targets, and returning to base with sufficient fuel after four or five hours flying From Pyongyang missions were much shorter, targets more effectively identified in the greater time so allowed, and external fuel tanks (in short supply) were unnecessary.[55] Such advantages of range were partly offset by the primitive operating facilities at the captured bases, facilities just barely adequate for the rugged Mustangs. Yonpo had some 30 buildings and 7 hangars, all of which had received bomb damage of various degrees.[56] Buildings at the Pyongyang airfields had also been badly damaged by UN air attack, and the retreating North Koreans had burned as many as they could. Nevertheless, laborers and construction materials were rounded up in Pyongyang for the repair of these fields, payments being made in rice, and air installations personnel repaired Pyongyang airfield (K–23) so that it fulfilled most of the 8th Group's requirements. But the 18th Group met difficulties flying off the sod field at Pyongyang East (K–24) for the alternately dusty and muddy landing strip presented hazards on take-off and landing: reduced visibility on one day caused the loss of two aircraft when one Mustang crashed into a truck

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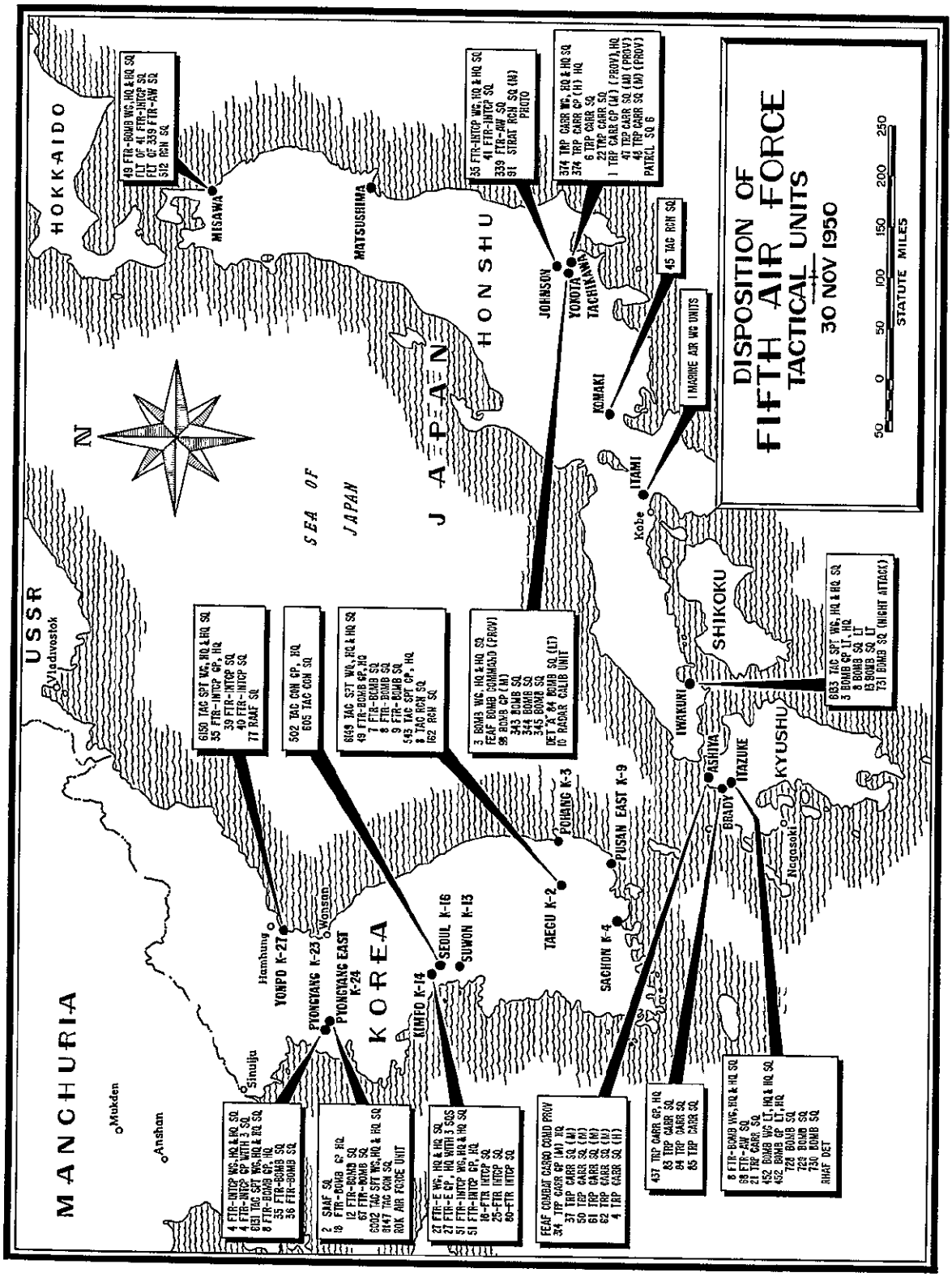


Figure 4

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towing another damaged plane off the runway. Although the Pyongyang fields were connected with the JOC in Seoul by a land line and VHF channel, communications were generally unreliable and intelligence information from Fifth Air Force was sparse and lacking in timeliness.[57]

Simultaneously with its movements into North Korea, the Fifth Air Force was confronting the range problem of its B–26 light bombers which were still based in Japan On 17 November, the 3d Bombardment Group, based at Iwakuni on Honshu, began staging 16 of its night-intruder aircraft out of Taegu airfield (K–2) Despite the logistical and intelligence problems posed, this staging operation shortened the distance which the intruder aircraft had to travel each night.[58] Just beginning combat operations was the 452d Bombardment Wing (L) which had been recalled to duty from reserve status at Long Beach, California, on 10 August 1950 After a period of intensive training in its specialty of low-altitude attack, the air echelon departed for Itazuke Air Base, Kyushu, from which base light bombers could reach the battle lines in North Korea without intermediate staging. Although water echelons comprising the main body of the 452d Wing did not reach Itazuke until 15 November, the combat echelon had flown its first combat mission on 27 October. Inspection reports rated training and attitude of personnel in the 452d Wing as excellent, but the immediate problem of the organization was inexperience: during November considerable damage to planes resulted from bombs dropped too low and from flying through rocket blast.[59]

FEAF Secures Reinforcements: During November General Stratemeyer worked diligently to secure the reinforcements which FEAF needed to combat the resurgent Communists: additional transport capability had to be gotten to meet the many requirements laid upon the FEAF Combat Cargo Command and modern USAF jet fighters had to be obtained to face the Red MIG–15's. Already the 437th Troop Carrier Wing had been recalled to federal service at O'Hare Field, Chicago, on 31 July for commitment to FEAF, and its C–46's began to reach Brady Field, Kyushu, on 8 November. Less than 12 hours after arrival in Japan, these planes were shuttling cargo into Korea, but General Stratemeyer knew that the 437th's airlift capacity no more than compensated for the declining capabilities of the C–119 aircraft of the Cargo Command, planes which had been flown unmercifully and were now beset by a variety of maintenance difficulties.* Rather than further to overload Korean airfields with additional planes, Generals Stratemeyer and Tunner initially favored additional manning which would provide a utilization rate of eight hours per day for the two C–54 squadrons of the 374th Troop Carrier Wing and six hours per day for the newly arrived 437th Wing, and FEAF requested this additional manning from USAF on 12 November.[60] On 21 November, however, Stratemeyer asked replacements for nine C–54's needing depot overhaul and for an additional squadron of these aircraft, a type best suited and most reliable for the Korean haul. "We are not panicky, but we are desperate," he concluded, "and are utilizing every cargo aircraft we own or can hire and we still are in bad shape." [61]

USAF responded to these requirements with alacrity. By mid-November the Combat Cargo Command had secured additional maintenance and aircrews, and as General Tunner had predicted, the airlift capacity of the 374th Wing jumped 33 per cent with the arrival of 22 additional aircrews and 279 maintenance technicians. On 22 November, USAF directed the movements of the 4th Squadron, 62d Troop Carrier Group, from McChord Air Force Base to Tachikawa, the squadron to be in place by 1 December. Due to the increasing seriousness of the Korean situation, two squadrons of the 61st Troop Carrier Group were also ordered to Ashiya airfield, and by 15 December all of these C–54's had entered operations from the Japanese bases designated for them [62]

Appearance of the Red MIG–15's gave FEAF an urgent requirement for jet fighters with higher performance ratings than its obviously outclassed F–80C's As early as August 1950, USAF had ordered a detachment of six F–84E fighters to Korea for service testings, pri-

*See Chap. VIII, p 245

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marily, however, as fighter-bombers FEAF at first had been reluctant to take these planes because of the added logistical complication, but combat developments early in November led General Stratemeyer to suggest the wisdom of the assignment of two F-84 wings to the Far East theater.[63] General Vandenberg instead immediately proposed to deploy to FEAF one F-84E and one F-86A wing within 25 days, contingent upon the ability of the Fifth Air Force to base them in Korea, a proposition which General Stratemeyer immediately accepted.[64]

On 9 November USAF alerted the Eastern Air Defense Force's 4th Fighter-Interceptor Wing at New Castle Airport, Wilmington, Delaware, and the Strategic Air Command's 27th Fighter-Escort Wing at Bergstrom Air Force Base, Texas, for expedited movement to Japan. Planes of the two wings were flown to San Diego, California, where between 14 and 27 November they were loaded on aircraft carriers. Advance personnel went to Japan by air, with the main contingent following by naval transport Because of the press for time, aircraft were deck-loaded on the carriers without adequate waterproofing, and although the last of the carriers had reached Yokosuka on 13 December, most of the planes had suffered varying degrees of corrosion particularly on wheels, brakes, and electrical terminals. "Two or three more days allowed in properly preparing the aircraft for shipment," wrote Col Ashley B Packard, Commander of the 27th Wing, "would probably have saved another week at this end." [65] Col. George F. Smith, commanding the 4th Wing, recommended that mechanics should accompany aircraft shipped by water so that they could perform daily inspections and renew waterproofing while en route.[66]

This movement of modern fighters to the Far East had been speedily accomplished, but by the time that they arrived the tactical situation in Korea was worsening for UN forces General Stratemeyer's first plan was to move combat echelons of the 4th Wing (F-86) to Pyongyang airfield (K-23) and of the 27th Wing (F-84) to Kimpo,[67] but this planned deployment was impracticable. Instead, a forward echelon of the 4th Wing went to Kimpo, where the first scheduled mission was flown with seven F-86's on 15 December, and the 27th Wing flew its first mission from Taegu (K-2) on 6 December.[68] Rear echelons of the 4th and 27th Wings were established, respectively at Johnson Air Base, near Tokyo, and at Itazuke.[69]

Regroupment of the UN Ground Forces: Withdrawal of the Eighth Army to the Chongchon River on 3 November and the subsequent delay of the ground campaign, MacArthur informed the JCS, was due entirely to logistical difficulties.[70] General Walker was anxious to resume his offensive at the earliest possible date but increasing enemy resistance demanded that he now employ both the U S. I and IX Corps, with a total of four American and four ROK divisions. To launch the projected operation, Walker therefore required a minimum of 12,000 tons for a 5-day supply level, in addition to 1,500 tons current daily requirement The Naval Forces Far East (NAVFE) were already at work to open the port of Chinnampo as a priority effort, and by 10 November this port was scheduled to be delivering 1,500 tons a day, while about 750 tons a day were to become available by means of railroad and truck shuttle between Seoul and Pyongyang. To make up the additional supplies, General Walker had strongly urged that he be given the entire capability of the FEAF Combat Cargo Command, about 1,000 tons a day.[71] That it was not possible to so commit all of the capability of the air transport service to the Eighth Army has been noted, and CINCFE orders had properly shifted a large part of the burden upon Combat Cargo to land and water agencies. The ports at Wonsan and Chinnampo were pressed into operation on 5 and 9 November, and later in the month channels into the harbors at Haeju, Hamhung, Sohojin, Iwon, and Kojo were cleared of mines and were receiving ships. A rail line was opened all the way from Pusan to Pyongyang in early November, but the highways remained in such poor condition that trucks moved with difficulty.[72]

During the two weeks following 10 November the Eighth Army and X Corps, waiting

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until they could accumulate supplies for the coming offensive, advanced cautiously against moderate resistance. While the Eighth Army continued limited operations designed to hold in northwestern Korea, the X Corps ambitiously expanded its holdings. On 11 November X Corps opened headquarters at Hungnam, and shortly afterwards it was reinforced at Wonsan by the U.S. 3d Infantry Division. In an effort to relieve pressure on the Eighth Army's right flank, General Almond began working elements of the 1st Marine and 7th Infantry Divisions through the mountain trails of central Korea to the Choshin (Changjin) and Fusen (Pujon) reservoirs. By 13 November the 7th Marine Regiment had reached the south end of the Choshin reservoir, gaining control of the extensive power installations located there. After capturing Kansan in a surprise action the day before, the 7th Division launched its 17th Infantry which was to reach the Yalu at Hyesanjin on 20 November. Far away up the east coast routes, the ROK Capitol Division was preparing to assault Nanam on 23 November.[73]

Thus far the UN forces in North Korea were more hampered by near-zero temperatures of the rugged mountains than with enemy opposition. "The situation here," commented one observer, "might well be compared to that of the Allied Powers in the Ardennes offensive during the winter of 1944–1945, when overpowering the enemy was only half of the battle."[74] Weather also had an increasingly negative influence upon air operations, with low clouds and snow storms further hampering identification of ground targets already obscured by prevailing morning fogs. Smoke reduced visibility in the battle areas On the Eighth Army front the supporting Fifth Air Force had few calls for close-support missions, and its armed reconnaissance flights could find few lucrative targets of opportunity.[75] The X Corps had air support from the 1st Marine Air Wing with three squadrons of F4U's and one squadron of F7F's operating from Wonsan, and one squadron of F4U's operating from each of two escort carriers (CVE's) lying offshore. Additionally, the *Valley Forge* and the *Leyte* went into action off the northeast coast of Korea on 6 November, attacking interdiction targets and augmenting X Corps support, and the *Philippine Sea* joined in the operations on 9 November. These fast carriers mustered about 225 aircraft, at least 75 of them being F9F Panther jets.[76] As on the Eighth Army front, however, targets for air attack were scarce in the X Corps area of operations.

THE AIR BATTLE FOR THE YALU

UNC Orders and JCS Discussions: Intending to discourage Chinese intervention in the Korean conflict, General MacArthur on 5 November 1950 directed FEAF to lay on two weeks of maximum effort. "Combat crews," he stressed, "are to be flown to exhaustion if necessary." FEAF was directed to destroy the Korean end (the first overwater span out from the Korean shore) of all international bridges on the Manchurian border. Starting at the Yalu and progressing southward to the battle line and excepting only Rashin, the Sui-ho dam, and other hydroelectric plants, FEAF was "to destroy every means of communication and every installation, factory, city and village" (see figure 5) But there must be no border violation; all targets on or close to the border were to be attacked only under visual flight conditions. General Stratemeyer at once implemented these orders, instructing the FEAF Bomber Command to destroy the Yalu bridges and the Korean cities and towns and the Fifth Air Force to destroy all other targets, including all buildings capable of affording the enemy shelter.[77]

MacArthur's order to FEAF displayed far more concern with the possibility of Chinese intervention than any information which he had furnished to the JCS, consequently, hard on the heels of the order to FEAF came a directive from the JCS that bombing of targets within five miles of the Manchurian

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border would be postponed. Although bombing of Yalu targets would undoubtedly contribute to the safety of the UN Command, the JCS feared that it might also be construed as an attack against Manchuria, and the matter would therefore require political consideration at intergovernmental levels. General MacArthur, however, remained adamantly opposed to any indication of weakness which he said might lead to another Munich. On 6 November, the same day as the MacArthur protest, the JCS cleared air attacks· FEAF was authorized to cancel all restrictions limiting attack against targets adjacent to the Manchurian border, but in areas adjacent to the Siberian border aircraft remained forbidden to attack north of a line running from Chongjin to Musan.[78]

On 7 November MacArthur requested instructions from the JCS as to the manner in which FEAF was expected to deal with the problem of MIG–15 operations from the sanctuary airfields across the Yalu, a problem which was already causing a loss of efficiency and morale to both air and ground troops and which was likely to assume decisive proportions.[79] In its consideration of this matter, the JCS applied a parallel principle adapted from naval warfare, called "hot pursuit." When a vessel ran a blockade, another nation's naval vessel was authorized to pursue it as long as it was in hot pursuit; it was therefore reasonable for a friendly aircraft, engaged by a MIG–15 near the border, to be able to pursue the MIG as he attempted to escape back across the Yalu. There was an additional doctrine of criminal law which allowed a peace officer to pursue a fleeing felon outside the area of his jurisdiction when he was in hot pursuit of the culprit. The Joint Chiefs, the State Department, and the President agreed that UN air in Korea should be authorized the right to pursue an attacking aircraft for "two or three minutes" flying time north of the Manchurian border, but the matter was so fraught with international complications that the U S Secretary of Defense requested the Secretary of State to inform other nations whose forces were fighting with the UN in Korea that the United States at an early date might permit its airmen to defend themselves in the airspace over the Yalu River. State dispatched such informative cables on 13 November, and by 23 and 24 November it had received the foreign reactions to the proposition, two nations being recorded as strongly negative. Within a few days after these views had been made known, the UN forces were driven so far southward from the Yalu that the U.S. Defense Department no longer considered the question of hot pursuit to be particularly pressing and the matter was dropped.[80]

In retrospect, FEAF would later conclude that "hot pursuit" would not have eliminated the MIG threat but would merely have disadvantageously displaced it rearward into Manchuria. Fuel problems would not have permitted F–86's based at Seoul to pursue the MIG's any great distance into Manchuria, and even if the enemy's sanctuary airfields along the Yalu had been bombed out, MIG's could still have continued to reach the Manchurian border from airfields in the Mukden complex.[81] That such a length of time was required by the JCS to secure reactions from other UN governments, however, was a fair indication of the problem of top level command incidental to the conflict in Korea: while the United Nations had designated the United States as its executive agent for the Korean war, it had established no UN authority to give military advice or command to the military undertaking.* When the U.S. "executive" encountered a problem deserving intergovernmental consideration, it was thus forced to discuss the matter through none too swift diplomatic channels Had the problem been of more pressing importance than was "hot pursuit," a 10 or 11 day lapse of time in arriving at a decision might have been fatal; as it was, by the time that "hot pursuit" had been discussed through normal diplomatic channels the Communists had already solved the matter on the battlefields of Korea.

Air Destruction of Enemy Supply Centers: The announced FEAF mission beginning on

*See Chap III, p 70

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5 November was to effect a complete interdiction of North Korean lines of communication, the destruction of North Korean supply centers and transport facilities, and North Korean ground forces and other military targets which had immediate effect on the current tactical situation. In recognition of the massive destruction capabilities permitted to the B–29 medium bombers by their large bomb-carrying capacity, much of this effort was delegated to the FEAF Bomber Command. The Fifth Air Force would provide fighter escort and combat air patrols so as to maintain air superiority, would undertake such destruction of hostile supply centers and interdiction targets as was practicable with its fighter-bombers and light bombers, and would maintain armed reconnaissance over enemy lines of communication both by day and night. Because of the urgency of the task and the reduction of medium bomber strength to three groups, FEAF secured a relaxation of the policy preventing use of incendaries against Korean targets: [82] FEAF directed Maj. Gen. Emmett O'Donnell, Jr., commanding FEAF Bomber Command (P) "to employ any type of ordnance . . which will best accomplish its object." General Partridge was similarly authorized to "utilize any ordnance available." [83] High-explosive general-purpose bombs were naturally recommended for attacking the approaches of the main bridges across the Yalu and the marshalling yard at Sinuiju.

FEAF target planners during October had given careful attention to the North Korean city of Sinuiju which lies on the south bank of the Yalu directly across from the Manchurian city of Antung Historically the city was of great sentimental importance to the Korean people· it was the symbol of leaving Korea for exile and of homecoming for the patriot. Now it was the last possible seat on Korean soil for the Communist government of Premier Kim Il Sung. Aside from psychological significance, a bombing attack would provide an additional restriction to the movement of military supplies from Manchuria into Korea and would destroy warehousing and accumulated stocks of military goods. In October FEAF intelligence had recommended against bombing attacks upon Sinuiju, lest that the Communists claim that UN air power was being used against civilian populations.[84] But now in November, with the danger of CCF intervention at hand, FEAF had to discount the sentimental for the practical, and on 4 November it directed Bomber Command to conduct on 7 November a maximum effort B–29 strike designed to destroy the key enemy communications and supply center at Sinuiju. The Fifth Air Force would provide fighter escort and combat air patrol for the bomber force.[85]

As a warm-up on 5 November, Bomber Command sent 22 B–29's to drop incendiaries on barracks and warehouses at Kanggye, a north central Korean town at the apex of transportation routes leading southward to Sinanju and Hamhung; the attack destroyed more than 65 per cent of Kanggye's built-up area.[86] After this preliminary attack the medium bombers stood down for maintenance on 6–7 November (adverse weather and delayed JCS approval having caused the postponement of the Sinuiju strike on the latter date [87]), and on 8 November 79 B–29's dropped on Sinuiju 584.5 tons of 500-pound incendiary clusters and 1,000-pound bombs, the latter being aimed at the approaches to the international bridges. Comparison of pre-strike and post-strike photographs showed that over 12,000,000 square feet (60 per cent) of the 20,000,000-square-foot built-up area of the city was destroyed. The Fifth Air Force provided a fighter CAP, fighter escort, and a preliminary fighter-bomber strike against flak installations which considerably reduced the volume of enemy ground fire. Other enemy guns on the Manchurian shore threw up a heavy volume of fire, but the bombers came over Sinuiju at 18,000- to 21,500-foot altitudes, with squadrons stepped up in close trail, cleared the target at the shortest possible bombing interval, and escaped damage. When the bombers had gone 48 F–80's and 21 F–51's which had been flying the CAP came down to attack targets of opportunity; the pilots reported, among other claims, one MIG destroyed and four MIG's damaged.[88]

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This Bomber Command strike against Sinuiju virtually eliminated the first of 10 priority communications and supply centers designated by General Stratemeyer.[89] Bomber Command subsequently prosecuted incendiary attacks against most of these towns with a part of its effort, generally hitting two or three on the same mission and striking Chongjin (Seishin) either visually or by radar when weathered out of the primary targets for the day.[90] Other key communications and supply centers were added to the list and were attacked by medium bombers.[91] Fifth Air Force fighters and light bombers added to the destruction in many of these same cities, generally taking out such buildings and warehouses as the medium bomber conflagration had missed.[92] As of 28 November, the results of these strikes against 10 of the city or village targets were unknown, but the results against 10 others showed that the percentage of destruction was: Manpojin, 95 per cent; Kanggye, 75 per cent; Hoeryong, 90 per cent, Namsi, 90 per cent; Chosan, 85 per cent, Sakchu, 75 per cent; Huichon, 75 per cent; Koindong, 90 per cent; Sinuiju, 60 per cent; and Uiju, 20 per cent.[93]

Employing 500-pound incendiary clusters fuzed to open 5,000 feet above the terrain, the medium bombers wrought heavy damages to supply and communications centers lying along the main communications lines between the bomb line and the Korean border. (See figure 5). While enemy opposition was sporadic, it was nonetheless costly: the 307th Bombardment Group lost a Superfortress to MIG interceptors on 10 November.[94] Two days later over Manpojin, heavy antiaircraft artillery fire from across the Yalu damaged a 98th Group B–29 so badly that it was forced to land at a Korean airfield.[95] A combination of enemy flak and weather conditions (planes were found to be icing severely at the usual 8,000-foot outbound cruising altitude) forced the medium bombers to higher altitudes, causing a serious rise in the incidence of engine failures and increased gasoline consumption.[96] Among other operational problems was a lack of proper target intelligence for some of the cities included for attack: the only photos of Musan, for example, were oblique, and in order to orient the target and avoid a border violation, both flight leaders had to make a preliminary pass over the city before bringing in the bomb run. Incendiary bombing of targets of opportunity, such as small towns along the Communist supply routes, indicated that the results would not be as satisfactory as on preplanned missions: the main fault was that the dimensions of these towns were not known and had to be estimated by the bombardier, often making for deficient bomb coverage.[97] These attacks against supply and communications centers, which promised shelter and were doubtlessly already concealing Chinese troops, would deprive the Communists of badly-needed protection against the frigid weather and space for storing supplies, as well as such materiel as they had already accumulated forward for their planned offensive.

Battle for the Yalu Bridges: The UN air interdiction effort ordered the destruction of the first span out from the Korean bank of the Yalu River bridges and marked every major bridge structure between the Yalu and the battle line for destruction. Concurrently, the Fifth Air Force was laying an all-out armed reconnaissance, by night and day, against everything moving on North Korean road and rail routes.

In all, there were 12 international bridge crossings of the Yalu, the most important of them to the tactical situation being those which lay in northwestern Korea: the combination rail and highway bridge and the double-track railway bridge at Sinuiju, the highway bridge at Chongsongjin, the railway bridge at Namsan-ni, the highway bridge and the railway bridge at Manpojin (see figure 5). Across the Sinuiju, Chongsongjin, and Namsan-ni bridges the Communists could rush forces to oppose the Eighth Army, and the Manpojin bridges would permit the Chinese to march down the center of North Korea and split the Eighth Army from X Corps. Other bridges, of lesser importance to the tactical situation, were the highway structures at Ongdmdong, Linchiang, the two at Hyesanjin (this town was occupied by UN forces on 20 November), at Samanko, and near Hoeryong.[98]

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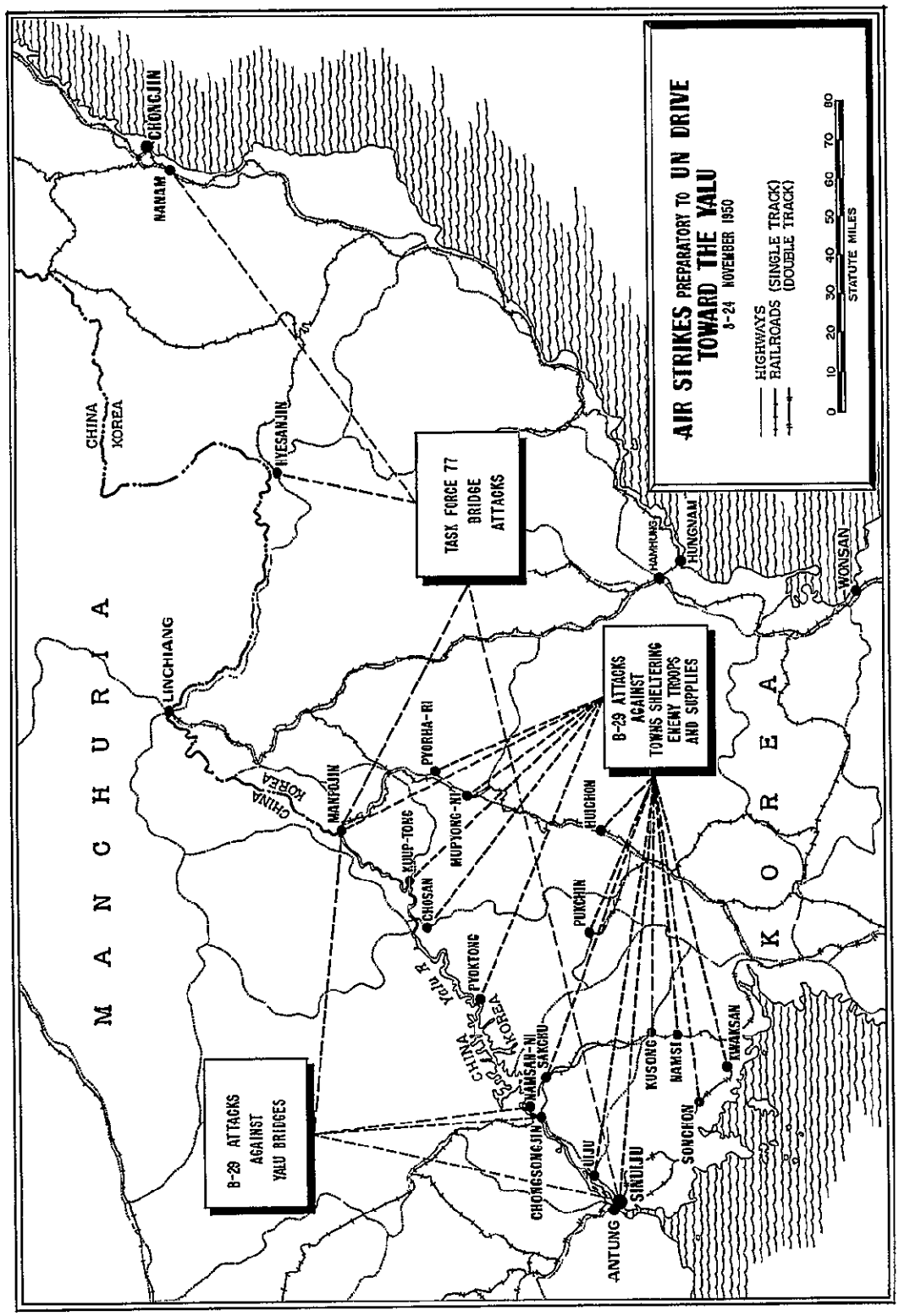


Figure 5

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In deference to the fact that these bridges were major steel structures, built by the Japanese to withstand great natural adversities, the Yalu bridges were assigned as FEAF Bomber Command targets: effective 8 November Bomber Command was directed to destroy the bridges at Sinuiju, Namsan-ni, Chongsongjin, Manpojin, and Hyesanjin, and by 17 November the entire list of bridges had been authorized for attack.[99] On 12 November, noting that much of its B–29 effort had to be committed to the destruction of enemy communications and supply centers, FEAF requested that Navy carrier-based air assist in the destruction of the international bridges.[100]

Bombing from an altitude of 10,000 feet with little or no enemy opposition, FEAF medium bombers had developed a high degree of proficiency in the bridge interdiction campaigns in South Korea, but even under these favorable circumstances the 19th Bombardment Group had been hard put to destroy the steel cantilever west railway bridge at Seoul, an effort which ultimately consumed 86 sorties and 643 tons of heavy demolition bombs. Bombing the Yalu bridges involved difficulties not previously encountered in Korea: enemy flak forced the bombers up above 20,000 feet and hostile fighters threatened the bomb runs; orders prescribed the destruction of Korean sections of the bridges and positively forbade violation of Manchurian territory, thus severely limiting the possible axes of attack against the bridges and permitting enemy antiaircraft artillery to zero in on the only possible flight paths of the bombers; the bridges could be attacked only under visual conditions which meant that cloud cover at the target diverted the bombers to secondary or last-resort objectives; to avoid border violations some of the bomb runs had to be cross wind (high level winds in excess of 120 knots were encountered) with as much as 28° drift. At these higher altitudes, the B–29 was inherently unsuited to pinpoint bridge-bombing, contributing factors to this incapacity being its extended bomb interval, inherent errors in its bombsight, and inaccuracies in altitude determination with the SCR–718 altimeter.[101] Efforts to use razon bombs against these pinpoint targets met little success partly because of continued control failures; the 1,000-pound razon bomb, moreover, was much too light for these steel structures.*

Bomber Command attacks against the Yalu River bridges began on 8 November, when nine 19th Group bombers utilized the cover of the massive attack against Sinuiju to drop 1,000-pound bombs on the abutments and approaches to the Sinuiju bridges. Following this attack, medium bombers did not again return to the Sinuiju bridges until 13 November when nine 98th Group B–29's walked their 1,000-pound bombs across the bridge approaches and covered both bridges well out to midstream. With three flights in close trail, the 98th Group passed over the target within 10 seconds, thus minimizing the time of exposure to antiaircraft fire. On the following day, Bomber Command sent a normal 3-group effort against the Sinuiju and Manpojin bridges; 21 B–29's of the 19th and 307th Groups fought off MIG and Yak attacks to drop 111 tons of 1,000- and 2,000-pound general purpose bombs in good patterns on the Sinuiju bridges but inflicted slight damages, probably because of the flak and fighters which badly damaged two 307th Group B–29's and the drift caused by a 95-mile-per-hour crosswind. At Manpojin, the 98th Group found cloud cover and was forced to divert to the secondary target of Nanam Weather again diverted 19th Group attacks against the Manpojin bridges on 20 November and 22 November.[102]

On 24 November weather improved, and all three medium bomber groups went out on interdiction missions, ranging from the Yalu to the bomb line. The 98th Group, with 8 B–29's, laid down its 1,000-pound bombs at the Manpojin railway bridge; while most of these bombs were accurately aimed, flak-evasion maneuvers and 17° drift caused some 8 bombs to fall in the mud flats on the Manchurian side of the river. Seven 19th Group planes dropped 2,000-pound bombs on the international highway bridge at Chongsongjin. Next day, four 19th Group B–29's had disappointing

*See Chap V, pp 141–42

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results at Chongsongjin, but eight other planes of the group reported destruction of at least one span of the Manpojin railway bridge. Enemy antiaircraft fire at Manpojin (a great proportion of it coming from across the Yalu) was now so severe that Bomber Command was authorized to suspend attacks on the bridges and instead effect multiple cuts on the railways and highways south of that city. On 26 November, eight 307th Group B–29's reported two spans of the Chongsongjin highway bridge in the water, but the status of this bridge remained in doubt; the 307th Group sent eight more B–29's there on 29 November to score hits on two spans, and the 19th Group repeated the raid on 30 November with eight B–29's which reported destruction of one span of the bridge. Because of a rack malfunction the 19th Group let one 4,000-pound general purpose bomb slip across the border to the Manchurian shore.[103]

Meanwhile, the planes of the aircraft carriers, *Leyte, Valley Forge,* and *Philippine Sea,* went into action against the international bridges on 12 November. The Sinuiju railway bridge proved as invulnerable to the Navy dive bombers as to the B–29's: "Knocking down that Sinuiju railroad bridge," commented the *Leyte's* air group commander, "was like tackling San Francisco's Golden Gate." The Sinuiju cantilever-span highway bridge was more vulnerable: a three-day attack dropped its Korean approaches Navy strikes also damaged the Manpojin railway bridge, and cut single spans out of the two bridges at Hyesanjin.[104] As with the medium bombers, Navy pilots reported severe antiaircraft and enemy fighter opposition; they too were forced to attack targets from inopportune bomb-run angles lest they violate Manchurian territory. The carrier pilots therefore found it impossible to attack the highway bridge at Namsan-ni without violating Manchurian air space, and this target—refused by Task Force 77—was ineffectively attacked by a single 19th Group B–29 on 24 November [104]

By the end of November the UN air effort had succeeded in cutting at least four of the international bridges and had damaged most of the other bridges,[105] but it was becoming increasingly evident that the returns were not commensurate with the effort expended. Medium bomber crews were approaching exhaustion; on 27 November FEAF was forced to permit a temporary reduction of the 19th Group effort from 12 to 9 planes daily because of crew fatigue and sickness. During the last week of November, moreover, aerial reconnaissance showed that the Chinese had managed to construct three new pontoon bridges and one wooden-pier bridge across the Yalu at critical junctions in northwest and north-central Korea.[106] The season was also approaching when the Yalu would be completely frozen over and bridges might be bypassed by routes across the river ice; prior to World War II, engineers of the South Manchurian Railway had been able to lay tracks across the Yalu ice and move very heavy loads safely. Examination of FEAF aerial photographs taken after 19 November showed the Yalu already frozen over between Sinuiju and Uiju, about halfway across at Manpojin, and completely frozen at Hyesanjin.[107]

After the beginning of the Red Chinese offensive, FEAF nevertheless recommended that Task Force 77 renew its attacks on the international bridges, but Seventh Fleet, with NAVFE concurrence, declined the invitation, believing that the current ground emergency necessitated the use of all carrier planes in close support.[108] On 4 December, FEAF Bomber Command recommended that it too be relieved from the international bridge mission, the effort being too costly for the returns which, even with maximum success, would be less than those accruing from attacks against hostile communications and supply centers.[109] Recognizing that the Yalu was now frozen over and that close support for the UN ground troops was urgently needed, FEAF directed suspension of the medium bomber campaign against the international bridges on 5 December 1950.[110] Bomber Command would renew the attacks in the spring of 1951 when the ice had broken up on the rivers of North Korea.*

South of the Yalu the medium bombers and the whole Fifth Air Force attacked hostile

**See* Chap II, pp 59–60.

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road and rail communications. When the B–29's could not hit their assigned bridges because of weather, they were briefed to undertake multiple railway cuts whenever this was at all possible Fifth Air Force fighter-bombers attacked bridges, tunnels, and such road or rail traffic as could be found. Night-intruder B–26's and Marine night-flying F7F's harassed road and rail traffic during the hours of darkness. After 10 days' all-out interdiction and armed reconnaissance, General MacArthur on 18 November announced that he believed that the air effort had been largely successful in isolating the battle area from added enemy reinforcements and had greatly diminished the enemy flow of supply.[111]

Eighth Army Attack and Communist Counterattack: On 18 November the Eighth Army logistical situation was showing substantial improvement at the same time that ten days' intensive air action had been hammering the North Korean communications and supplies, on that date General MacArthur, after noting both factors, fixed 24 November as the day for the main Eighth Army attack.[112] There had been some evidences of stiffening enemy opposition: as early as 9 November a build-up of enemy forces in the Choshin-Fusen Reservoir area had been noted, a concentration which could launch a counteroffensive to the southeast and Hungnam-Wonsan or to the southwest against the gap between Eighth Army and X Corps.[113] South of the UN lines, Communist guerrilla troops were redoubling their efforts to sabotage communications and rail lines with the result that some 30 per cent of the total UN troop strength in Korea had to be used in combatting these fanatical partisan units [114] But as yet there was little cause for alarm among the UN forces: the 136,000 Eighth Army troops on the northwestern front faced an estimated enemy force of 95,000, 55,000 of whom were believed to be Chinese [115]

As was scheduled, the UN offensive which was designed to carry to the Yalu began in the Eighth Army zone at 1000 hours on 24 November; next day, the 24th Division rolled into Chongju, a key transportation junction on the west coast only 53 miles from the Manchurian border. But enemy opposition had begun to build up on the right and center of the Eighth Army, and it was evident that the enemy meant to fight. General MacArthur therefore ordered the X Corps to attack northwestward toward Mupyong-ni and the Yalu River on 27 November, thereby beginning an enveloping maneuver calculated to squeeze the Communists between advancing elements of the two UN commands On 26 November, however, a Communist counterattack had already halted the Eighth Army's I and IX Corps, while the main force of the Red offensive poured down the central mountain ranges upon the ROK II Corps which was driven out of its anchor position at Tokchon. On 27 November the ROK II Corps collapsed, and Communist troops poured into the area, thus effectively splitting Eighth Army from X Corps. Apparently, the enemy meant to turn the right flank of the Eighth Army and then wheel west to sever the army's rear area communications. The Eighth Army saw no choice but to retreat, and it began to pull back on 28 November. That same day, another enemy force heavily engaged the 1st Marine Division on the X Corps front and cut the supply routes of the two regiments of this division which had pushed to the northwest side of the Choshin Reservoir.[116]

Concealed behind the sanctuary of the Yalu, it is evident that the Communists had laid a trap which was designed to ensnare and surround both Eighth Army and X Corps, certainly the Eighth Army. It is entirely probable, as Generals MacArthur and Walker concluded, that only the Eighth Army attack, which had provoked the Communists into premature action before they could double their flanking forces, revealed the trap and permitted UN ground forces to fall back in time to save themselves.[117] Information obtained from Red prisoners of war made it starkly evident that the Chinese incursion into Korea was the result of a prepared plan of aggression which first collected large forces along the Yalu River, and at the proper moment organized the crossing into Korea. On 7 December the UN Commission for the Unification and Rehabilitation of Korea identified

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Red China as the aggressor: "On the basis of existing evidence the Commission has come to the conclusion that Chinese forces in great strength are attacking the United Nations force in North Korea and that these Chinese forces form part of the armed forces of the People's Republic of China" [118]

Deficiencies in UN Aerial Reconnaissance: The Communist order of battle as published in official intelligence reports of the UNC early in December 1950 identified the Red Chinese Third Field Army attacking X Corps and the Fourth Field Army opposing Eighth Army. Together the two armies had 29 infantry divisions and at least 1 cavalry division. Initial troop strength estimates fluctuated at from 438,000 to 487,000 hostiles in Korea, with an additional strength in Manchuria sufficient to raise the enemy order of battle to 740,000 men.[119] Intelligence reports continually reported "hordes" of Chinese, and it appears that seldom did less than a "horde" attack any UN position, even if held by a platoon.* The major defect in these UN intelligence estimates was that they found their main source for order of battle in prisoner of war interrogations, and each prisoner of war obligingly provided data in reference to the location and identification of enemy units Unfortunately in early December 1950 there was no means by which the validity of these order of battle estimates could be checked and they had to be accepted by Eighth Army, which therefore had no choice but to fall back as fast as possible to escape annihilation. If the friendly intelligence estimates were not correct then the Eighth Army was made victim of a very clever political and psychological ruse, for the UN withdrawal provided the enemy time and space in which to increase his total forces in Korea.[120]

Although it may appear doubtful that the Chinese could have committed nearly a half-million men to battle in Korea under conditions of virtual secrecy, it is nonetheless certain that bodies of Chinese troops moved to the front in considerable numbers without detection. Portions of General Lin Piao's Fourth Field Army could march from the Yalu to battle positions opposite the Eighth Army front in two or three nights, with the troops avoiding the roads by day, traveling close to mountain slopes where they were not easily detected, and exercising very severe camouflage discipline. The initial attack, however, was not made against the Eighth Army front, but against its right flank, and these flanking forces required some time to position: marching only at night over mountain trails, the Chinese 112th Division required 15 days to reach Kaechon.[121] The two armies (corps) of General Chen Yi's Third Field Army which were initially committed against X Corps apparently crossed the Yalu between 20 and 30 October, whence they moved slowly and cautiously southward toward the Choshin-Fusen reservoirs.[122]

That the UN forces in Korea had no means to determine accurately the size of their opposing enemy and that bodies of Chinese troops were able to reach flanking positions was due in great measure to the deficiencies of UN aerial reconnaissance. From the outset of Korean hostilities reconnaissance aviation had been the weakest element of the FEAF and its build-up had been extremely slow * Other than such work as could be done by the Mosquito airborne control aircraft, the Fifth Air Force possessed no visual tactical reconnaissance in November. The only night-reconnaissance capability was the 162d Tactical Reconnaissance Squadron, Night Photo, whose RB-26's flew only 114 combat sorties during November, a good proportion of these being illumination missions for the Marine F7F night-intruder squadron.[123] The limited day potentials of the 8th Tactical Reconnaissance and the 91st Strategic Reconnaissance Squadrons were heavily committed to photographing the Yalu bridge crossings, and while the 8th Squadron did not neglect the battle area its aircraft were of such limited number that they could infrequently search any area

*In the spring of 1951 one version of a joke circulated in Korea had a soldier saying, "I was attacked by two hordes and killed both of them" A variation had the soldier asking, "How many hordes to a platoon?" [E J. Kahn, Jr., *The Peculiar War, Impressions of a Reporter in Korea* (New York: Random House, 1952), p. 6]

*See Chap VIII, pp 221-34

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other than that immediately adjacent to the enemy's main lines of communications.[124] Whether or not any amount of aerial reconnaissance, however great, could have penetrated the excellent Chinese camouflage discipline is problematical, but certainly the FEAF reconnaissance establishment was deficient in its capabilities

Plans for the UNC Retreat: Confronting a fresh enemy force which possessed superior numbers, the UN Command had first of all to secure its forces from destruction. General MacArthur's immediate solution was to have X Corps contract its position into the Hamhung-Wonsan sector as enemy pressure developed, while the Eighth Army fell back toward Pyongyang and Seoul. His reasoning was that the geographical position of X Corps at Hamhung and Wonsan would constitute a threat to the enemy's supply lines through central Korea, and that the Communists could not penetrate southward until they had contained the threat of the X Corps.[125] The JCS held a contrary viewpoint: the widening gap between the X Corps and Eighth Army would permit the enemy to move large forces southward through the Korean mountains They therefore urged MacArthur to extricate X Corps from its exposed position and to coordinate its employment with Eighth Army.[126]

At this point MacArthur reasserted that he could not hold a 150-mile long defense line across Korea with the forces at his disposal, facing the entire Chinese nation with his depleted divisions, he insisted that a new appraisal of strategy was in order Unless substantial ground reinforcements were furnished, the UN Command would face steady attrition in its retreat to beachhead defense positions. The strategic concept used successfully against the North Koreans was not applicable against the Chinese Communists The situation called for "political decisions and strategic plans . . . adequate fully to meet the realities involved." [127] These "political decisions and strategic plans" were going to be discussed intensively at the end of December,* but on 4 December the JCS could do no more than approve MacArthur's plan to consolidate Eighth Army and X Corps into beachheads, the preservation of the UN forces in Korea being the primary consideration.[128]

During the first week of December, Gen. J Lawton Collins, Chief of Staff, U.S Army, visited Tokyo for discussions. Here General MacArthur could see no alternative to the withdrawal of the UN troops through successive defensive positions to the Pusan area; if reinforcements were not to be made available, MacArthur recommended that the entire command be evacuated from Korea as soon as possible By 7 December, the United Nations Command had drawn the necessary operation plan: Eighth Army would withdraw in successive steps, holding the Seoul area as long as possible; X Corps would evacuate the Hungnam-Wonsan area and join Eighth Army, at which time command of X Corps would pass to Eighth Army. On 9 December the JCS gave their approval of this plan.[129] Both ground commands had already begun their withdrawals, well before the issuance of these official operations orders.[130]

*See Chap II, pp 42-45

UN AIR ACTION AGAINST THE ADVANCING CHINESE

The Air Mission: During the period of the UN ground withdrawal from North Korea, a period which may be conveniently terminated on 26 December 1950, the FEAF announced no change in its air missions, which remained stated in these words:[131]

> This Command will continue attacks to effect the complete interdiction of North Korean lines of communication, the destruction of North Korean supply centers and transportation facilities, North Korean ground forces and other military targets which have an immediate effect on the current tactical situation. This Command will continue to maintain air superiority, furnish close support to ground units, and air transport operations as required

In context with the tactical situation the FEAF may be said to have had three functions: to prevent hostile air from interfering

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with UN ground and naval movements, to destroy the enemy on the ground so permitting the ground disengagement, and to assist the ground retreat by air transport of supplies and troops. In no phase of the Korean fighting did air power give more intimate assistance to the accomplishment of the ground mission.

Yet, as General Weyland has pointed out, it would be incorrect "to regard all . . . air operations against ground forces merely as support of the army." [132] Actually during this period of UN ground retreat, the UN air was the only force fighting the Communists and it exercised a coordinate mission which sought to delay Communist ground advances and to destroy the Chinese Communist armies. As had been the case in the 1950 summer campaign against the NKPA, air operations were the decisive element in stopping the enemy's offensives and in reducing his capacity to wage ground warfare. Although close air support contributed, the major effect upon the enemy was produced by air power applied in the rear of the enemy's front line combat zone.

Maintenance of Air Superiority: As soon as the Chinese unveiled their MIG–15 air force, all ground and air operations in Korea were vitally dependent upon the maintenance of a working UN air superiority. During November and December 1950 the battle for the control of the air over North Korea continued with the struggle gaining intensity over the northwest corner of the peninsula, an area lying between the Chongchon and Yalu Rivers and popularly called "MIG Alley." At Antung the enemy had resurfaced the gravel runways with concrete and had constructed hard-surface taxiways leading to reveted parking stands. While it was evident that the main MIG strength was based around Antung, appearance of jet fighters over northeast Korea on 28 November indicated other hostile bases in Manchuria.[133]

On occasion the enemy MIG's were seen as far south as Sonchon and Taechon, keeping themselves well within the 90 miles which appeared to be their usual radius of action with internal fuel, but they generally preferred to remain in the area immediately adjacent to the Yalu, diving out of their sanctuary in flights of four or small sections of six to eight aircraft when they had an opportunity against inferior numbers of UN aircraft.[134] Fortunately the enemy pilots were generally unaggressive at a time when the UN did not possess an aircraft capable of dealing with the MIG: although three separate flights of 49th Fighter-Bomber Group F–80's were bounced during December, always with the enemy possessing superior numbers and in one case 24 to 4, the MIG pilots failed to press the advantages of their swept-wing fighters over the slower F–80's.[135]

The F–80's and F–51's were not long required to continue unequal air combat with the MIG's for seven 4th Fighter-Interceptor Wing F–86A's reached Kimpo on 15 December, and within the following ten days this strength was increased to 25 aircraft, all that the crowded facilities there would permit. Sabre missions, as scheduled by Fifth Air Force JOC, were entirely combat air patrols, and by 2 January 1951, when the Sabres had to evacuate Kimpo, the detachment had flown 280 sorties, or 415 hours and 45 minutes of combat time. Initially all advantages in air combat lay with the enemy: they were fighting near their sanctuary and could break off combat at will; they invariably attacked from superior altitude out of the sun whenever possible; they usually attacked when the F–86's were nearing the end of their 20-minute patrols and were short of fuel. Although the MIG–15 appeared superior in performance to the Sabre, pilots of the F–86's were more skilled and during their initial month of operations destroyed 8, probably destroyed 3, and damaged 2 of the MIG's. The Sabres scored their first victories on 17 December 1950 when four MIG–15's were shot down, and on this day Lt. Col. Bruce H. Hinton was the first Sabrejet pilot to destroy a MIG. One F–86 and its pilot were lost to enemy action on 22 December.[136] While enemy MIG's always outnumbered the Sabres, neither side during December 1950 apparently possessed overwhelming numbers of swept-wing interceptor types. During the last week of December, 168 MIG sorties were sighted, including the climactic engagement on 30 December be-

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tween 36 MIG's and 16 F–86's during which 2 MIG's were damaged. Thereafter until 6 January 1951 the MIG's stood down, whether the CCAF was licking its wounds or awaiting the outcome of the ground offensive then under way was a matter of conjecture [137]

Interdiction and Armed Reconnaissance: The inability of the Chinese to mass sufficient strength for all-out attacks against the Eighth Army and X Corps reflected the effectiveness of the air interdiction of enemy lines of communication back to the Manchurian border, an effort which was intensified when the Chinese Communists entered the Korean fighting. On 9 December, Maj. Gen. O. P. Weyland, FEAF vice commander for operations, stated that the main medium bomber effort was to be placed on a planned interdiction program designed to limit troop movements and resupply by rail southward from the Yalu; attacks upon towns or areas not a part of the interdiction program would be undertaken when an accumulation of troops or supplies made them particularly remunerative.[138] Effective on 15 December, FEAF therefore instituted Interdiction Campaign No 4, a scheme of operations which divided North Korea into 10 zones with targets selected in each zone on the basis of the greatest expected return from their destruction. The program was such that if all bridges were attacked and kept unserviceable, the enemy would not have a stretch of rail longer than 30 miles [139]

As the FEAF Bomber Command instituted this interdiction campaign it was nevertheless apparent that the interruption of North Korean lines of communication would be somewhat more difficult than similar undertakings earlier. Due to hostile fighter interceptions, interdiction targets in MIG Alley had to be attacked by bomber formations large enough to enable mutual protection; no longer would a single plane be permitted multiple runs over a bridge target. Nor were small formations immune to enemy attack. MIG's attacked a formation of five B–29's northwest of Sinanju on 6 December, sending two of them limping to emergency landings at Kimpo and Itazuke.[140]

During the first three weeks of December, Bomber Command attacked marshalling yards, rail facilities, and supply areas at Manpojin, Kunu-ri, Huichon, Sinanju, Tokchon, Anju, Pukchang-ni, Sunchon, Songchon, Sukchon, Kanggye, Yangdok, Kandong, Sariwon, Pyongyang, Chongju, Kujang-dong, and Pakchon. On 10 December, K–23 and K–24 airfields at Pyongyang were post-holed with 500-pound bombs to prevent the Chinese from using these recently abandoned fields; on 14 December, 19th Group B–29's bombed Pyongyang's marshalling yard and associated storage areas to destroy abandoned UN equipment before the enemy could make use of it. On 21–22 December, Bomber Command devoted its entire force to 4-plane bombing attacks against North Korean bridges with good results.[141]

After the first week of December the Eighth Army was generally out of contact with the enemy and the Fifth Air Force was able to fill the air with armed-reconnaissance sweeps and interdiction missions, swelling the totals of such sorties flown by FEAF aircraft during December to 7,654 interdiction and armed-reconnaissance sorties.[142] These armed-reconnaissance sorties were extremely lucrative, reaping heavy casualties from among the masses of Chinese who initially jammed the roads in bold daylight movements. When the enemy crossed the Chongchon River at Sinanju and Kunu-ri, 49th Group F–80 pilots made the water run red with enemy blood [143] When its combat pilots or reconnaissance missions noted heavy concentrations of hostile troops, the Fifth Air Force requested the diversion of B–29 medium bombers to those area targets: thus Tokchon, Anju, and Pukchang-ni were hit by B–29's on 4 December and Sunchon, Songchon, and Sukchon on 5 December.[144] While FEAF did not consider it very practicable to divert medium bombers from preplanned targets to poorly identified targets of opportunity, it nevertheless ordered the medium bombers kept loaded with 500-pound bombs for emergency strikes requested by Fifth Air Force [145] The results of this air destruction of enemy combat personnel enroute to the battle area were tremendous: by mid-

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December, General Stratemeyer estimated that 33,000 enemy troops, the equivalent of four full-strength Chinese divisions, were dead or wounded as the result of strafing, bombing, and napalming of the combined UN air power.[146]

The Fifth Air Force armed-reconnaissance sweeps got poorer results once the Chinese realized that their initial attack had failed, for the enemy immediately returned to his accustomed practices of camouflage. Although vehicle ruts on the snow-covered roads bespoke a large amount of traffic, the enemy vehicles were concealed by day in draws, ravines, under bridges, and in other carefully camouflaged positions along the main supply routes. These targets were exceedingly difficult to spot and to destroy.[147] In the latter half of December, troop movements of the enemy were made under cover of darkness or if by necessity in daylight under rigid camouflage discipline. One Chinese prisoner of war reported that troops subjected to aerial attack during daylight marches were under strict orders to remain immobile in ranks lest a dash for cover assist the aircraft pilot in locating his target; Communist commanders would kill any man who stirred from a fixed position.[148] A combination of weather and operational difficulties further reduced the effectiveness of the armed reconnaissance. Fuel contamination at hurriedly occupied South Korean bases gave rise to an epidemic of rough engines. The added distance from the South Korean bases necessitated the use of wing tanks (which, being in short supply, could be dropped only in an emergency) and permitted the fighters less time in which to search out and attack targets in the forward areas.[149] Snow and ice picked up on take-off froze on the bomb shackles making it difficult for the fighters to release their napalm tanks.[150] But in spite of these difficulties and the elaborate caution manifested by the Communists, who now had an obvious respect for air power, the FEAF continued to exact a respectable toll of destruction. Between 15 and 30 December, FEAF aircraft killed another 6,694 enemy troops (slightly less than another CCF division) and destroyed 17 tanks, 60 field guns, 26 locomotives, 542 vehicles, and 4,168 buildings capable of sheltering enemy personnel or stores.[151]

Traffic indications on the North Korean roads and the dearth of daylight sightings meant that the enemy was committed to heavy night movements, and, since rail movements on the west coast lines were very slight, the enemy was evidently supplying an estimated 430,500 combat troops with night-moving vehicular transport.[152] To combat these night movements, the Fifth Air Force possessed only the understrength 3d Bombardment Group with a total of 47 assigned B–26's. These night intruders encountered most of the weather difficulties confronting other aircraft of the command: none of them were winterized and icing conditions posed a hazard to flying personnel and aircraft, forcing aborts from assigned missions. Despite fuel difficulties at the staging base of Taegu (K–2) the 3d Group nevertheless flew 856 sorties in December, nearly all of them at night.[153]

At a time in which the UN ground armies were generally out of contact with the enemy, FEAF aircraft according to conservative estimates killed enemy personnel equivalent to five Chinese divisions The effort was quite evidently demoralizing. on 28 December four 67th Fighter-Bomber Squadron F–51's bombed and strafed enemy positions approximately 80 yards north of friendly troops near the Hwachon Reservoir, when the attack was over, approximately 126 Chinese soldiers who had had enough of air attack came in to surrender.[154] In addition to the hostile personnel killed in action the air attacks which destroyed potential or actual billeting areas contributed indirectly to extensive Chinese personnel losses due to frostbite and freezing. A Far East Command intelligence source reported large bodies of casualties being moved northward during the last week of December. Fully half of these men had frozen hands and feet; they "seemed to have been cut off from their command headquarters, and apparently had no regular supply lines, largely as the result of United Nations air action."[155]

Close Support for Eighth Army: In addition to the 7,654 interdiction and armed-reconnais-

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sance sorties, FEAF aircraft flew 3,569 close-support sorties during December,[156] chiefly in support of the Eighth Army. Such close-support activity was heaviest at the beginning of December when the Eighth Army was breaking contact with the Chinese and again at the end of the month when the Chinese were finally struggling into position to assault the UN battle line.

As the Eighth Army met and then broke away from the initial Red Chinese assaults, air support played an important role, both blunting the force of the enemy attack and clearing out the roadblocks which hostile infiltrators erected behind the Eighth Army. At 0130 hours on the night of 27/28 November, for example, the 25th Division, at the center of the Eighth Army, was so hard pressed by Communist assault that its commander requested B-26 support, a somewhat unusual procedure since up to that time direct support of the tactical line had not been attempted by air during a night engagement The bombers were there within 30 minutes, strafing less than 50 yards in advance of a hard-pressed infantry company, which subsequently reported· "The surprise and extreme accuracy of the fire had a marked effect on the Chinese, for it came right at the crisis of the fight, when it seemed most doubtful . . . that any part of the company could survive." [157] Since these particular targets, identified by white phosphorus smoke shells, were so close to friendly positions, the B-26's could not use their 500-pound bombs, but elsewhere on the I Corps front on 28 November B-26's instituted a technique new to Korea when, under control of a 3903d Radar Bomb Scoring Squadron MPQ-2 radar sited near the battle line, they bombed within 1,000 yards of friendly positions at night.[158]

The heaviest ground fighting, however, was developed on the Eighth Army's right where the U.S 2d Division, the Turkish Brigade, and the British Commonwealth 27 Brigade bore the brunt of an enemy attack, which had it succeeded would have encircled the whole Eighth Army. Because of air action a good many of the Chinese soldiers who assaulted the 2d Division never reached effective positions for an attack. this division reported that some 600 Reds were sealed underground in a coal mine by 500-pound bombs and that large bodies of enemy troops were strafed and bombed along ridges southeast of Chon-dong, including one group of 50 Chinese caught by crossing an open field and fired to the last man with napalm.[159]

Still more valient close air support was provided the 2d Division, which, while it held the critical position at Kunu-ri, was encircled by enemy infiltrators who erected roadblocks on the escape route southward to Sunchon. As the division, unaware of the extent of the enemy activity, began an administrative motor march back to Sunchon on 2 December it encountered and had to run through one roadblock over five miles long, culminating at the highest point of the Kunu-ri to Sunchon road called "The Pass," a defile about one-quarter mile long where the road ran through a cut with steep embankments of dirt and loose rock rising 50 feet above the right-of-way. As it ran this ambuscade, manned by a CCF division, the 2d Division could not fight back, but Fifth Air Force fighter-bombers bored in at minimum altitude throughout the day to beat down the enemy machine-gun fire which threatened destruction to the entire division. The commander and assistant division commander later expressed high praise for the effective air support given them during this action, asserting that without air support the whole division might never have weathered the Chinese fire.[160] An army report described the action as the 2d Division ran the hostile gauntlet in these words:[161]

> All such counter-hitting as was done was on improvisation of the moment, according to any one man's imagination and strength, and his ability to bring a few others to his purpose Among the higher commanders, this entailed calling on tactical air for utmost support, which was given without stint until dark closed on the scene. As a measure of the closeness of this support, it is reportable that while numerous friendly personnel suffered varying degrees of concussion from the rocket explosions, none was known to be killed by it Napalm was seen to roll down and over the road, still without doing hurt to the column. Also, the air support was effective The knocking out of more enemy po-

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sitions and the neutralizing of greater numbers of CCF personnel were attributed to air intervention than to any ground weapon.

Much of this air support was given by the F–80's of the 51st Fighter-Interceptor Wing which flew 763 supporting sorties for the 2d Division during the several days that it was in trouble.[162]

After 2 December the Eighth Army had escaped serious difficulty from enemy action, and by 14 December it was massed in a group of positions extending from the Kumpo peninsula on the west to Choksong near the Imjin River north of Seoul, thence east across Korea to the Sea of Japan. After it had broken off from the enemy the Eighth Army required little close support, but in the last week of December 1950 the Chinese were again pressing and supporting air action was once again in order. On 23 December General MacArthur requested that approximately two-thirds of the B–29 effort of FEAF be normally expended against towns and villages suspected to be hostile assembly areas in front of Eighth Army General Weyland thereupon cut back on the B–29 interdiction: one-fourth to one-third of the B–29 effort would remain on rear-area rail interdiction, and the remainder would be placed upon troops and supplies to the immediate rear of enemy lines.[163] At about the same time Fifth Air Force night intruders undertook more intimate support of the Eighth Army's main line of resistance, utilizing a new technique whereby the B–26's dropped flares along the battle line at the direction of an F–82 all-weather fighter or a tactical air control party and then went down to strafe designated targets, getting in two or three passes under each flare. This technique was shortly modified so that other B–26's, scheduled for night-intruder missions, were directed to work with flare B–26's in close support along the battle line. The latter system proved effective against the enemy and a definite morale boost for the friendly ground forces,[164] but the diversion of night effort to front-line targets, like that which sent the B–29 medium bombers by day against villages adjacent to the battle zone, reduced the UN air interdiction campaign against the well-traveled main supply routes of North Korea

Evacuation of X Corps: The crisis on the X Corps front was potentially more hazardous and much longer-lived than that which had confronted the Eighth Army. By 3 December elements of the 1st Marine and 7th Infantry Divisions were cut off from escape in the vicinity of the Choshin reservoir. By existing command arrangements, the Fifth Air Force had charged the 1st Marine Air Wing with the support of X Corps, requirements in excess of Marine air capabilities to be reported for Fifth Air Force or FEAF Bomber Command performance In addition, Navy carrier-based air groups were available for employment against X Corps targets Perceiving the critical situation in the Choshin area, General Partridge released his Yonpo-based 35th Fighter-Bomber Group for close support there on 28 November, and after a visit to Hungnam on 3 December he placed the entire B–26 effort at the disposal of X Corps when it wanted such night or day light bombardment effort.[165] Informed that bad weather on 1 December was keeping Marine and carrier-based aircraft out of action, Partridge extended support to the trapped Marines.[166] FEAF informed X Corps that its medium bombers would be available if they were needed.[167]

To the besieged ground troops battling in sub-zero temperatures, the strong air-supply support extended by the FEAF Combat Cargo Command was not less vital than the firepower of UN tactical aviation On 28 November, FEAF Combat Cargo Command planes dropped 10 tons of ammunition to the 5th and 7th Marine Regiments at Yudam-ni, while the 31st Infantry Regiment, cut off on the east side of the reservoir near Sinhung-ni, received 16 tons of airdropped ammunition. Ten C–47's of the 21st Troop Carrier Squadron managed the first day's supply drops, but by noon of the 29th, X Corps had called for over 400 tons of airdropped matériel needed to supply the besieged ground units. Action had to be taken immediately to step up the airdrop system which had previously been geared to a maximum capability of 70 tons a day· Cargo Command dispatched three C–119's and

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supply packers to Yonpo airfield (K–27), while back at Ashiya Air Base the 2348th Quartermaster Airborne Air Supply Company augmented its strength with borrowed military and Japanese personnel and began around-the-clock packaging of supplies, including rations, small arms and artillery ammunition, POL products, clothing, and weapons. On 4 December FEAF instructed Cargo Command to utilize its C–119's, C–46's, and C–47's in support of X Corps, leaving only the C–54's to serve Eighth Army and Fifth Air Force [168]

During the two days in which the airdrop system was geared up to a 250-tons-per-day capacity, the drop operations continued into Yudam-ni and Sinhung-ni, but on 1 December the airdrop machine was in full operation and on that day, already benefited by some accumulation of aerial supplies, the Marine and Army units began fighting their way back to a concentration point at Hagaru-ri, a position which the Marine regiments and a few survivors from the 31st Infantry reached on 3 December Beginning on 1 December, the 1st Marine Regiment had also moved north from Hungnam to open the supply routes, getting as far as Koto-ri, seven miles of winding valley road and Chinese roadblocks distant from Hagaru-ri, before the Chinese cut this rescue regiment off to the front and rear. Cargo Command now had to drop supplies to both Hagaru-ri and Koto-ri.[169]

Although the airdrops were providing the bulk of the food, ammunition, and supplies for the encircled ground troops, other lighter transports added to the airlift support. Within the initial two-mile-diameter circle at Hagaru-ri the troops there on 30 November had scratched out a rocky strip, barely wide enough to accommodate a C–47, and on 7 December another such strip was hewn at Koto-ri. By 10 December, 240 sorties, most of them flown by the 21st Troop Carrier Squadron, brought into the crude airstrips 273.9 tons of supplies, and, what was more important, flew out 4,689 evacuation cases on their return trips. Planes of the 1st Marine Air Wing shared 56 sorties of the total, while the C–47's of the Royal Hellenic Air Force detachment, new to the theater and attached to the 21st Squadron, flew 30 sorties carrying cargo but no evacuees. Medical care for the evacuation cases was provided by the 801st Medical Air Evacuation Squadron. Although fraught with dangers of the rocky strips and continuous hostile harassing fire, these evacuation sorties not only saved the lives of wounded men who would have died in the frigid weather but benefited the morale and mobility of the 1st Marine Division.[170]

On the morning of 5 December, General Tunner, commander of the FEAF Combat Cargo Command, flew into Hagaru-ri with a proposal that he would evacuate all of the encircled Marines by air, but Maj. Gen. Oliver P. Smith, commanding the 1st Marine Division, instead asked for continued airdrops and even for able-bodied air-delivered replacements: the Marines were determined to fight their way to safety.[171] Two days later the Marines were ready to break out of Hagaru-ri to meet the 1st Regiment pushing out of Koto-ri, but just north of the latter village infiltrating Chinese had blown out an apron bridge across the reservoir pennstocks, directly above the facing of a 1,500-foot-deep gorge. Unless the bridge could be replaced, the two regiments attempting to escape Hagaru-ri would have to abandon their vehicles, tanks, and artillery, and make it out on foot. General Smith now made the rather remarkable request that an eight-span M–2 treadway bridge, complete with plywood planking, be dropped from the air to his forces. Each span was 5 x 16 x 2 feet in dimension and weighed 2,900 pounds; when packaged for dropping each span weighed an even 2 tons The practicability of such a drop being subject to question, the C–119 detachment at Yonpo made an unsuccessful trial drop, using six G–1 parachutes attached to a single span; no more time could be given to experiments, so the eight spans were each loaded into a C–119 and instead of the smaller chutes two G–5 parachutes were hitched to the ends of each span. Beginning at 0900 hours the planes departed Yonpo at 5-minute intervals, and at Koto-ri they let down among the mountains to 800 feet and spilled the spans over an unmarked drop zone. All of them were pronounced serviceable on the ground, the bridge

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was assembled and laid in place under enemy fire, and the 1st Marine Division got together just north of Koto-ri on the night of 7 December.[172]

Late on the afternoon of 8 December a 3d Division task force from Hungnam broke into Koto-ri and with a little more airdropped supply for the road the 1st Marine Division was soon out of trouble. After 13 days of unceasing enemy attacks, the Marines and remnants of the 31st Infantry escaped the enemy, the Marines coming out as units with the bulk of their heavy equipment despite the most adverse terrain, weather, and combat conditions. This they were able to do because of airdropped supply, the sole source of supplies for a unit exceeding division strength for 13 days. A total of 1,580.3 tons of supplies and equipment had been dropped by 313 C–119's and 37 C–47's, and for the first time in history an entire bridge had been dropped by parachute.[173] For the part they played in the successful evacuation of the ground troops from the Choshin Reservoir, the 314th Troop Carrier Group, the 21st Troop Carrier Squadron, and the 801st Medical Air Evacuation Squadron were simultaneously awarded Distinguished Unit Citations, the first such awards to Air Force units in the Korean War.[174]

When the 1st Marine Division was back in the Hungnam-Hamhung perimeter on 11 December, the X Corps got seriously down to the task of wholesale evacuation. By sea, the corps could be taken out in 10 days, provided the Chinese allowed this much time before launching massive attacks. Even though water lift would move the bulk of X Corps, General Almond desired to use air evacuation to the maximum. Yonpo airfield was made available to transport aircraft, but just to be safe in case the Chinese broke through the perimeter before X Corps could finish its loading, a smaller strip, designated JADE, was constructed on the beach.[175] The maximum-effort air evacuation from Yonpo got under way on 14 November and ended at 0900 hours on 17 November, when the X Corps could no longer secure the airfield against the Chinese, who were now around the edges of the field. During these four days, Combat Cargo Command kept up a 24-hour day operation, with planes taking off at 5-minute intervals. Using nearly all its strength, the command flew 393 sorties from Yonpo, lifting 228 patients, 3,891 passengers, and 2,088.6 tons of cargo, including 772.2 tons of ammunition and 439 vehicles.[176] While efficiently managed, the transport operation was not without its frantic moments. Aircrews got very little rest in what was usually bad-weather flying; more often than not the crews had to assist with loading in order to speed their turnarounds. Fatigue and tension developed into illnesses, requiring hospitalization of six pilots in the 1st Troop Carrier Group (P).[177] Maintenance crews worked desperately on four C–119's down for mechanical difficulties, which if not repaired would have to be destroyed at 0800 on 17 November. A broken elevator was replaced on the first of these planes; another with fuel-pump failure was flown back to Ashiya by use of the primer; two entire engine assemblies were pulled off a plane at Ashiya and flown to Yonpo in time to save the third; and only the fourth C–119, which encountered a scavenger-pump failure at the last moment, had to be destroyed.[178] The 314th Troop Carrier Wing could nevertheless report with an understandable degree of pride that: "As the air evacuation ended, every request for airlift had been fulfilled."[179]

Movement by sea permitted the evacuation of the bulk of X Corps troops and supplies, outloading being accomplished at Hungnam, Songjin, and Wonsan. The great majority of these men were unloaded at Pusan, although 19,000 ROK's disembarked at Samchok and a smaller number went ashore at Ulsan. As the perimeter shrank, naval gunfire and carrier aircraft laid down a continuing barrage to hold the enemy at bay, while Fifth Air Force B–26's supported the defense at night. Finally, at 1436 hours on 24 December the evacuation was completed.[180] Through control of the air and of the sea, the UNC had been able to withdraw its forces from their exposed beachhead in northeast Korea.

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REDEPLOYMENT AND REORGANIZATION OF THE FIFTH AIR FORCE

Withdrawal of Air Units from North Korea: Collapse of the UNC offensive in North Korea and the necessity of withdrawing the ground forces before they were swallowed up by the Chinese allowed Fifth Air Force very little time to retrieve its forward units. Air Force units, moreover, were generally short of allotted vehicles and consequently lacked ground mobility in what was to be a road race back to the 38th parallel.

The most serious losses to the Fifth Air Force in the evacuation from North Korea befell the 605th Aircraft Control and Warning Squadron at Sinanju; in November 1950 this squadron was farthest forward of air units. The 502d Tactical Control Group had been deployed to Korea with a shortage of trucks, and it had been compelled to mass all of its vehicles in order to get the 605th to Sinanju. When, on 29 November, the 605th was given three hours' notice to evacuate the forward area, it therefore had little alternative but to destroy its radar and camp equipment. As the Fifth Air Force director of operations stated: "A million and a half dollars worth of equipment . . was lost for the lack of a few trucks." [181] The other aircraft control and warning squadron in North Korea—the 6132d at Pyongyang—was able to evacuate to Taegu without loss of equipment.[182] Had these air warning units possessed their proper ground transport, or even more important, had the radars been air transportable, the Fifth Air Force might have saved this valuable signal equipment.

Elsewhere in North Korea the tactical wings pulled out as quickly as air and surface movement permitted. (See figure 6.) The 35th Fighter-Interceptor Wing at Yonpo (K–27) was ordered to move the bulk of its troops and property by LST to Pusan (K–9) on 3 December; the movement was accomplished without interruption to combat missions and within a few days the group's F–51's were "operating as smoothly as ever." [183]

Evacuation of the 8th Fighter-Bomber Wing from Pyongyang (K–23) was complicated by the wing's first experience with enemy air retaliation: a Communist light plane dropped 3 fragmentation bombs near the flight line on the night of 27 November, killing 1 airman and damaging 11 Mustang fighters. Engineering personnel nevertheless worked around the clock to repair the damage, and only two of the planes had to be destroyed. Advance echelons left K–23 for the Seoul municipal airport (K–16) on 29–30 November, and on 3 December the wing evacuated Pyongyang, beginning operations at K–16 from a temporary grass runway. Within a week K–16 was becoming too exposed to enemy infiltrators to permit air operations, and since the 8th Wing was already designated for conversion to F–80 jet fighters, its flyable Mustangs were transferred to the 18th and 35th Groups, and the 8th Wing moved back to Itazuke on 10 December. Here on 24 December, the 8th Wing was rejoined by its 80th Squadron, already equipped with F–80's and previously attached to the 51st Wing, and as of 31 December all three 8th Group squadrons were operational, although the 35th and 36th had not received all of their authorized jet fighters.[184]

The 18th Fighter-Bomber Group began evacuating Pyongyang East (K–24) early on the morning of 1 December when the first C–119 took off with personnel, baggage, tents, and stores, and it completed its move to Suwon airfield (K–13) on 4 December, only a few hours before enemy troops reached Pyongyang. The Suwon airfield, already judged unfit for jet operation, possessed a badly damaged concrete runway, and the 822d Engineer Aviation Battalion was evacuated from Pyongyang to construct the necessary PSP taxiways and a perimeter road. But in the middle of December, the units at Suwon were again ordered to fall back: the 822d Battalion going to Pusan (K–1) while the 18th Group moved by rail to an old Japanese airfield on the south coast of Korea at Chinhae (K–10), leaving a servicing detachment at Suwon to stage Mustang missions. Although Chinhae's

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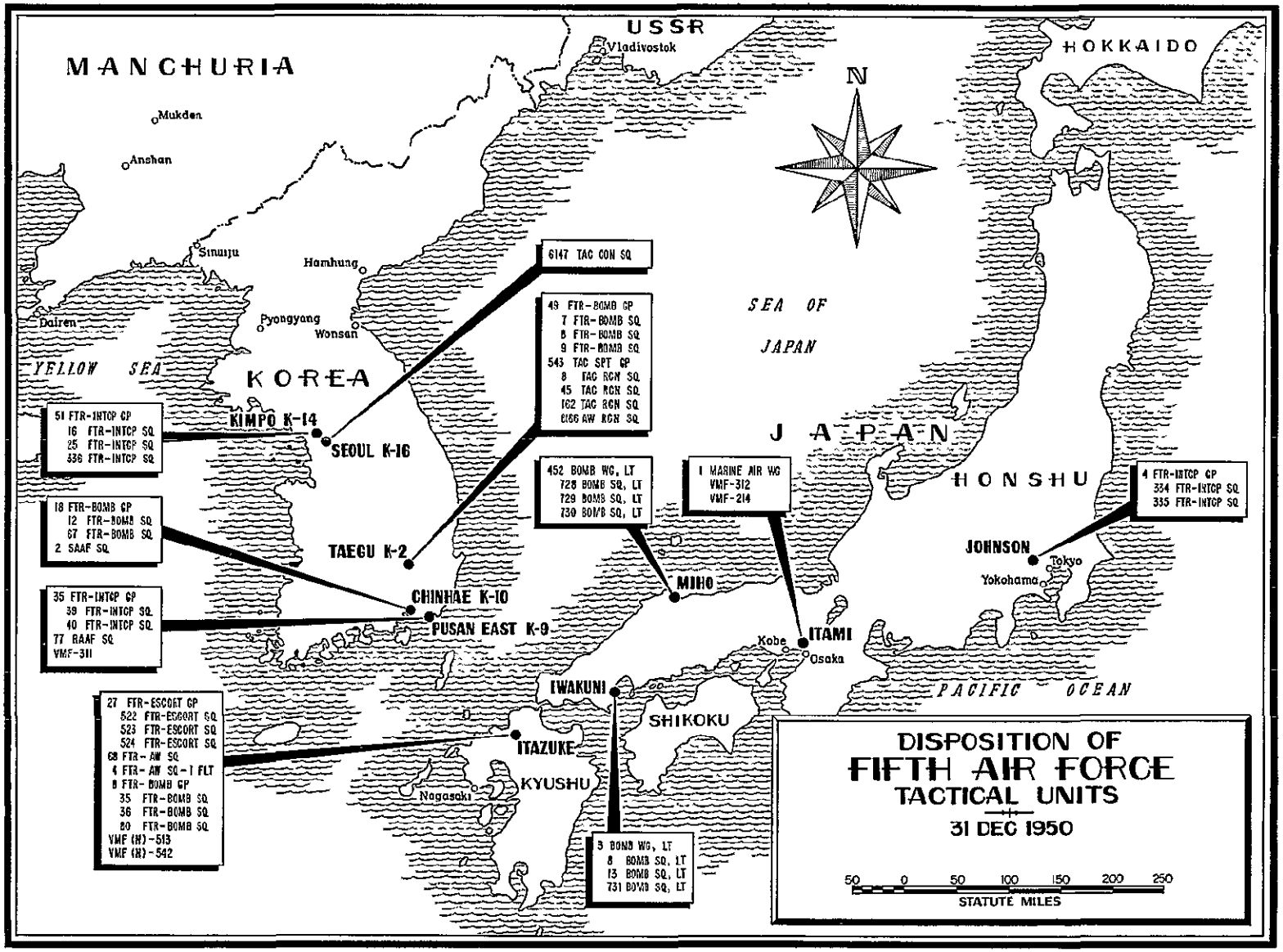


Figure 6

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short sod runway was surrounded by such hazards to flight as hangars, a sea wall, and nearby mountains, the new base proved such "a veritable heaven" after the cold and mud at Pyongyang and Suwon that the servicing detachment began to call it the "Riviera." The SAAF 2 Squadron accompanied the 18th Group in its movements.[185]

Simultaneously with these wing movements, other Fifth Air Force units found new stations in South Korea. The 6147th Tactical Control Squadron (Mosquito) moved from Pyongyang (K–24) to Seoul (K–16) and thence to Taegu. The 6151st Air Base Unit, which had been providing services for the 1st Marine Air Wing at Yonpo (K–27) evacuated that field on 17 December and went to Pohang (K–3) where Marine air units were locating.[186] Since the Marine air wing had no supporting elements and could sustain itself ashore only about two weeks before returning to its carriers, General Partridge had to commit the major parts of the 811th and 822d Engineer Battalions and the 6152d Air Base Unit to prepare and service the airfield at Pusan (K–1) which was also being occupied by Marine air units.[187] The 6146th Air Base Unit, charged with training and servicing the fledgling ROK Air Force, departed Pyongyang on 6 December for Taejon (K–5) and on 17 December sent a detachment to Cheju Island, 70 miles off the southern tip of Korea, where training could be presumably conducted without further interruption.[188]

Not only was the Fifth Air Force compelled to evacuate North Korea, but as the Communists pushed south of the 38th parallel early in December it had to depart the Seoul-Kimpo area. On 10 December the 51st Fighter-Interceptor Wing was moved from Kimpo to Itazuke, leaving its fighter group and certain rear elements of the support groups at the Korean base. The 4th Fighter Wing also continued to stage from Kimpo, moving additional F–86's there on 20 December when the 80th Fighter-Bomber Squadron returned to Itazuke to join its parent 8th Group. On the first few days of January 1951 all of these units had to leave Kimpo, the 51st concentrating at Itazuke and the 4th at Johnson Air Base.[189] Back in Japan, the 452d Bombardment Wing (L) moved to Miho airfield on Honshu early in December in order to clear Itazuke for fighter units.[190] Headquarters installations of the Fifth Air Force at Seoul, including the JOC and TACC, were broken up and evacuated to Taegu on 20 December in a combined air, rail, and motor movement. On the night of 21 December communications were cut over from Seoul to Taegu, permitting the final evacuation of headquarters buildings forward.[191] Movement of Fifth Air Force headquarters to Taegu was coordinated with that of the Eighth Army, which also established its main command post in Taegu on 22 December.[192]

While the Fifth Air Force once again managed its movements without taking the tactical units off operations for a single day, it would be an oversimplification to conclude that such a tremendous job of redeployment was not without difficulty. Army traffic in support of its troops used the major capability of all surface transportation. North of Seoul the traffic was extremely complex: the railway was single tracked into Pyongyang, and over this route Eighth Army was sending up supplies and reenforcements at the same time that the Air Force was attempting to get its units southward. Explosion of an ammunition train in the main rail yards at Pyongyang finally terminated rail lift from this area. Heavier items of Air Force equipment were outloaded first at Chinnampo and then at Inchon, but the number of LST's available for Air Force lift was limited Road movements were hazarded by solid columns of vehicles, bumper to bumper, from Pyongyang to Seoul. If a truck stopped, it was pushed aside and set on fire rather than to delay the entire column [193] Accidents on the treacherous Korean roads also took their toll: the 605th Aircraft Control and Warning Squadron lost a comparatively large amount of scarce equipment in three accidents, one involving a truck which left the road and rolled down a mountain.[194]

Except for the use of the air transportation made available by the FEAF Combat Cargo Command, it is doubtful that the Fifth Air

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Force redeployment could have been managed without grave losses of equipment. Between 1 and 15 December, Cargo Command lifted 5,069.3 tons for Fifth Air Force, or 35 per cent of the total tonnage carried; between 16 and 31 December it lifted 2,885.0 tons, or 35.8 per cent of its total tonnage for Fifth Air Force.[195] In these movements the transport control officers noted a marked improvement in the ability of units to prepare themselves for aerial movement; some of the organizations had been airlifted as many as four times since the beginning of Korean operations and had now developed a much improved concept of air movement.[196] Many of the transported organizations had to destroy such superfluous items as locally manufactured chairs, desks, cabinets, mess tables, and the like but there was not too much impairment in their operational efficiency after the aerial movements.[197]

Reorganization of Fifth Air Force: Although the action had been previously planned, it was perhaps appropriate that the reorganization of the Fifth Air Force came on 1 December 1950 at a time when Chinese intervention indicated a prolonged continuation of hostilities. In July 1950 it had been hard to believe that the Korean campaign would be of long duration, and the command structure had been modified only to meet immediate needs. General Partridge, together with Brig. Gen. Edward J. Timberlake, Fifth Air Force vice commander, had taken to the field with an advance echelon of Fifth Air Force headquarters (designated Fifth Air Force in Korea after 24 July 1950). A rear echelon of Fifth Air Force headquarters, commanded by Brig. Gen. Delmar T. Spivey, who was also designated Fifth Air Force vice commander, remained behind in Nagoya. In short, the Fifth Air Force in Korea fought the tactical air while Fifth Air Force Rear maintained occupation, rear-area, and air-defense responsibilities in Japan, but lines of control and responsibility under this arrangement were subject to the confusion of two headquarters and divided staff offices.

The divided Fifth Air Force span of control had been necessary since it lacked any available headquarters between Air Force and Wing level, and on 1 December 1950, when approval from USAF was forthcoming for the new organization, General Partridge activated under General Spivey's command the 314th Air Division, charged with three main functions: air defense of Japan, logistical support for Fifth Air Force combat efforts in Korea and for all assigned or attached units in Japan, and control of the Japanese airfield-construction program.[198] Simultaneously, Headquarters and Headquarters Squadron, Fifth Air Force, was transferred less personnel and equipment to Seoul where it absorbed the personnel and equipment of the discontinued Headquarters and Headquarters Squadron, Fifth Air Force in Korea.[199] Since the Fifth Air Force staff engineer would now be able to give his full attention to Korea, the I Construction Command (P) was discontinued, effective 1 December.[200] While the new command structure was thus announced effective on 1 December, some time would be required before all the new relationships would be worked out.*

Concurrently with this revision of command structure, the Fifth Air Force readjusted its wing-base organizations. Rather than to rearrange its existing establishment in Japan at the outset of Korean hostilities, the Fifth Air Force had chosen to utilize temporary air base units in Korea instead of its regular wing organizations. When the war continued, it had been necessary to redesignate these units as provisional wings under table of distribution allotments of personnel and equipment. The USAF concept of the wing-base plan was quite the contrary: to leave detachments at rear bases and to move the regular units forward, but once the Fifth Air Force was committed to the opposite idea it was difficult to remedy the matter. Supply requisitions and shipments from the United States and elsewhere, for example, had been made in the name of temporary wings and changing shipping designations would cause confusion. Nevertheless, on 1 December, Fifth Air Force ordered the paper transaction necessary to give the wings which were fighting the war the advantages of a regular status: the 18th Fighter-

*See Chap III, pp 79-82.

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Bomber Wing replaced the 6002d Tactical Support Wing, the 8th Fighter-Bomber Wing replaced the 6131st Tactical Support Wing, the 49th Fighter-Bomber Wing replaced the 6149th Tactical Support Wing, the 35th Fighter-Interceptor Wing replaced the 6150th Tactical Support Wing, and the 3d Bombardment Wing (L) replaced the 6133d Tactical Support Wing. New table of distribution airbase wings were organized to operate Itazuke, Johnson, Yokota, Misawa, and Clark Air Bases.[201]

These changes in designation gave the combat wings regular status and also opened the way for dealing with manning problems. At the outset of Korean hostilities most FEAF units, instead of being immediately organized at war strength, had been augmented with additional combat crews and limited numbers of maintenance and supporting personnel. As a temporary measure, such action was acceptable, but under sustained operations it would result in reduced effectiveness. By way of illustration, the 51st Maintenance and Supply Group noted that the peacetime authorization of its POL section was based upon a schedule of operations from an established tank farm or aqua system, whereas in combat such facilities were not available. In order to speed refueling of fighters, additional personnel and equipment was required to de-drum and operate a temporary tank-farm system.[202]

Some remedial action, especially in the critically short armament fields, had come on 2 November 1950 when FEAF fighter units were reorganized under the peacetime column of new tables of organization.[203] On 29 December, however, General Stratemeyer requested authority to reorganize FEAF units under the appropriate war columns.[204] On 10 January 1951 USAF approved the reorganization of all FEAF tactical wings and all tactical separate squadrons on the war columns,[205] and most Fifth Air Force units were so placed under the war columns of their tables of organization and equipment on 2 February 1951.[206] Although the additional personnel authorized FEAF by these changes would not be easy for USAF to supply, these reorganizations had the salutary effect of placing regular wings on a war footing for extended hostilities. The Korean war was now plainly no longer temporary, to be met by make-shifts

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Chapter II

COMMUNIST ATTACK AND UNITED NATIONS COUNTEROFFENSIVE

As they later reviewed their operations, the Chinese Communists stated that their first-phase offensive had begun at the Yalu on 25 October 1950 and had concluded at the Chongchon River on 8 November; during this phase UN air action had successfully upset Chinese efforts to maneuver into position for a massive surprise assault which would have overwhelmed and surrounded UN ground forces in North Korea. What the Chinese called their second-phase offensive had begun at the Chongchon on 25 November and had ranged to the Taedong River on 25 December; in this phase UN air power had blunted the initial force of the Chinese assault, had shielded and assisted the withdrawal of Eighth Army and X Corps, and then after about 3 December UN air had been the only force opposing the ponderous advance of the Chinese ground armies. By intensified interdiction and armed reconnaissance the UN air force had held the forward progress of the Chinese down to approximately eight miles per night and had simultaneously wreaked such havoc within the Chinese armies as once again to blunt the force of their ground attack, when, on 31 December 1950, they launched their third-phase offensive.

In the period of respite permitted by UN air action, the Eighth Army during December 1950 occupied positions immediately south of the 38th parallel covering the South Korean capital of Seoul. While directing these defensive preparations, the Eighth Army commander, Lt. Gen. Walton H. Walker, was killed in a jeep accident on 23 December. His immediately designated successor was Lt. Gen. Matthew B. Ridgway, who assumed his new duties in Korea on 26 December 1950, the same day that X Corps became subordinate to Eighth Army. General Ridgway completed the dispositions of Eighth Army as follows: on the left flank to the northwest of Seoul was the U.S I Corps; north of Seoul was the U.S. IX Corps; remaining sectors from Kapyong to the east coast near Yangyang were held by the ROK III, II, and I Corps, but the U.S X Corps was enroute to the key communications center of Wonju, whence it would be able to hold a blocking position behind the ROK units at the center of Eighth Army.[1] (See figure 7.)

Each day that the Chinese Communists delayed their attack, the Eighth Army gained in strength and bettered its defensive positions, but the Far East Command was nevertheless apprehensive about what the enemy had in mind. Until 20 December ground fighting on the Eighth Army front was generally limited to patrol skirmishes, chiefly by North Korean screening troops, and the whereabouts and intentions of the main body of the Chinese Communist forces was undetermined Believing that the task of locating the Chinese armies was possible of accomplishment by aerial reconnaissance, General Stratemeyer assigned it to General Partridge on 20 December in a strongly worded directive: "It is . . . directed that you, by every reconnaissance means possible and by photography both day and night, by daylight strip photography, carry on, working 24 hours a day if need be, to find out where these Communists are " [2] Gen-

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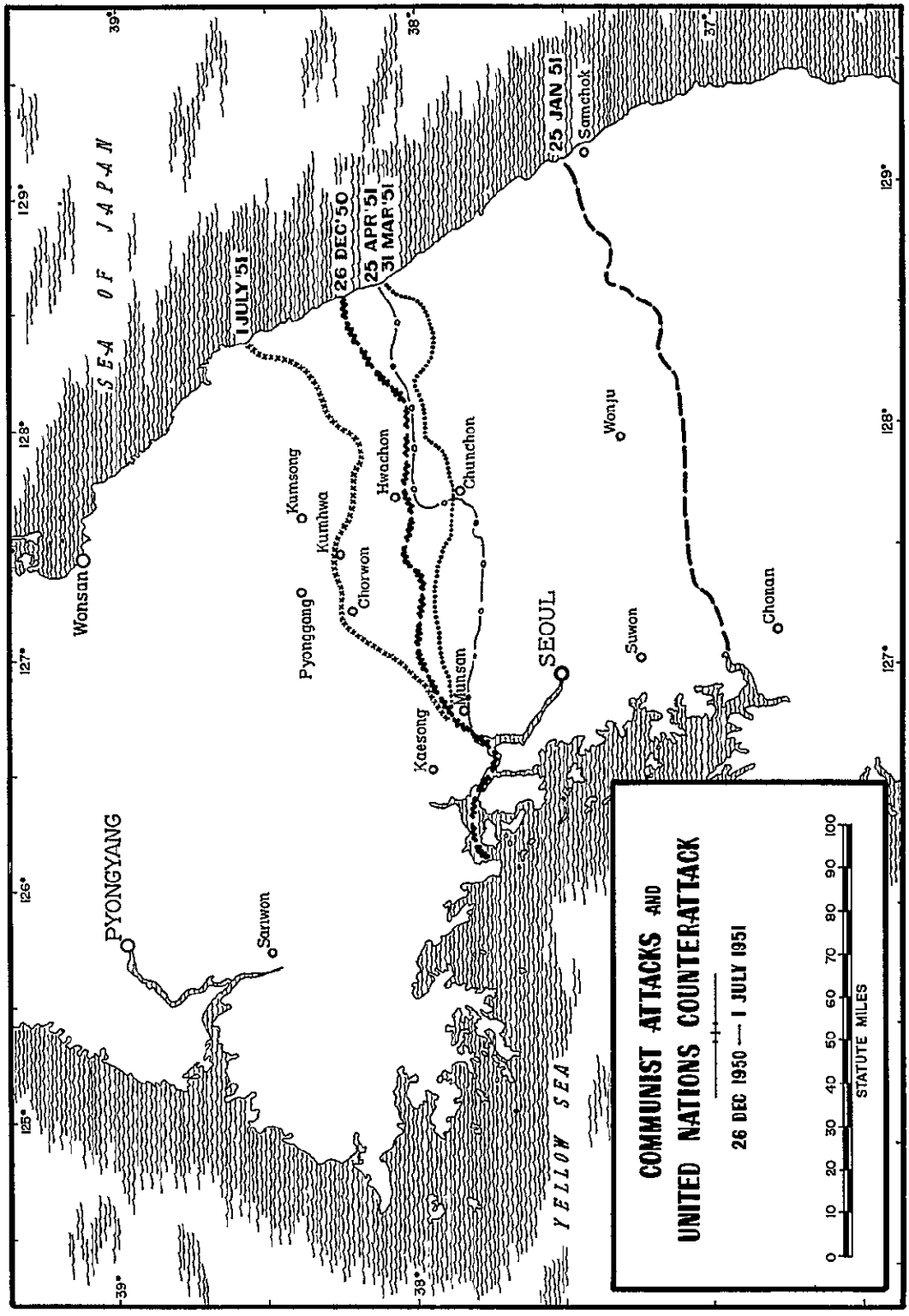


Figure 7

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eral Stratemeyer also requested USAF to furnish at least three of the best photo interpreters available; two days later he requested USAF to dispatch Col. K. F. Polifka, one of its foremost reconnaissance experts.[3]

For eight days following 20 December, all other reconnaissance was postponed while the 8th Tactical Reconnaissance Squadron sent out RF-80 missions in which five aircraft aligned themselves in parallel course to a leader in the center in order to obtain maximum area mosaic coverage. The system was thought unsatisfactory for mosaic photography, but it reduced duplication and cut down on the enormous task of plotting.[4] Night photography was flown by the 162d Tactical Reconnaissance Squadron, the photographs not uncommonly revealing large bodies of enemy troops on the roads enroute to the front.[5] By 1 January 1951, 207 photo missions were flown; 27,643 negatives processed, and 55,286 photographic prints produced. Augmented by interpreters flown from the United States and drawn from other theater organizations, the 363d Reconnaissance Technical Squadron expended 5,600 man-hours on the interpretation of these photographs.[6] Fifth Air Force later felt that the project's exact purpose—to locate the Chinese Communist troop units—was not accomplished.*

*See Chap VIII, p. 224.

Photographic cover did, however, disclose probable enemy billeting areas which were flashed to FEAF Bomber Command for attack, but FEAF thought that most of the areas designated (in one case 14 square miles) were too large for saturation strikes with available B-29's.[7] After the first few days, most of the photo interpreters were convinced that area coverage of mountains and forests was unprofitable and that concentration on the snow-covered roads which showed heavy usage by southbound traffic would be more revealing, but the concept of area cover was not modified.[8]

The combination of such information as aerial reconnaissance gave concerning enemy troop concentrations in the Pyonggang-Chorwon-Kumhwa triangle and increasing ground pressure on ROK troops at Chunchon, Yonchon, and Hwachon permitted the UNC a fairly accurate estimate of Communist intentions: the CCF evidently intended to make a sharp thrust through central Korea, swinging southwestward to trap the bulk of the Eighth Army in the Seoul-Inchon area until a massive frontal attack from other Chinese divisions in the west could crush it. Against such an attack, the Eighth Army planned to withdraw further south and avoid encirclement, even if the action meant giving up Seoul and Inchon.[9]

MATURING A NEW UNITED NATIONS STRATEGY

General MacArthur Requests New Decisions and Plans: While his thoughts incorporated in his messages to the Joint Chiefs of Staff were by no means always entirely clear, General MacArthur, following the Chinese intervention in the Korean war, appreciated that the strength of the UNC as compared to the Chinese lay in its air and navy. "You are a bridge player," MacArthur later explained to an interrogating senator, "You know that the first rule in bridge is the lead from your strength."[10] Yet the UNC's surface-oriented strategy in North Korea had not maximized the use of its air power, and when the Chinese invaded, General MacArthur saw the major air opportunities as lying in Manchuria and in China rather than in North Korea.

How General MacArthur meant to employ his UN air power against the Chinese homeland was not apparent in his messages to Washington. On 6 November 1950 he noted that men and materiel were pouring into North Korea from across the Yalu and suggested: "The only way to stop this reinforcement of the enemy is the destruction of these bridges and the subjection of all installations in the north area supporting the enemy advance to the maximum of our air destruction."[11] What MacArthur meant by "the north area" was not clear, but on 9 November

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he again suggested that the United States should press for the adoption of a United Nations resolution condemning the Chinese Communists for their intervention in Korea and "calling upon the Communists to withdraw forthwith to positions north of the international border on pain of military sanctions by the United Nations should they fail to do so." [12] Following the all-out Chinese entry into Korea, General MacArthur on 29 November proposed to negotiate with the Chinese Nationalists for the dispatch of Chinese Nationalist Army combat troops to Korea, and on 3 December 1950 he noted that: "Our relatively small force now faces the full offensive power of the Chinese Communist nation augmented by extensive supply of Soviet materiel. . . . This calls for political decisions and strategic plans . . . adequate fully to meet the realities involved." [13]

At the end of December 1950, as the Chinese Communists were building up against the Eighth Army's Imjin River line north of Seoul, General MacArthur became more explicit: he stated that the UNC would probably be forced to evacuate Korea if CINCUNC was not permitted to receive some 60,000 Chinese Nationalist reinforcements from Formosa, bomb China's industrial capacity, establish a naval blockade of the China coasts, and get additional American troops. Once again, however, the reference to bombing China was in the form of a suggestion: "Under existing restrictions," MacArthur stated, "our naval and air potential are being only partially utilized. We could destroy Chinese industrial capacity to wage war through our bombardment and naval gunfire." What was MacArthur's last recommendation came on 11 February 1951: "It is evident," MacArthur informed the JCS, "that the enemy has lost his chance for achieving a decisive military decision in Korea, but it retains a potential as long as its base of operations in Manchuria is immune to air attack." [14]

Actually General MacArthur was more precise in his verbal statements regarding bombing than in his messages. When Gen J. Lawton Collins, U.S Army chief of staff, was in the Far East on 15 January 1951, MacArthur made it perfectly clear that he believed that the UNC ought to bomb into Manchuria.[15] And in hearings before a congressional committee on the military situation in the Far East during the late spring of 1951, General MacArthur was fairly explicit in stating what his intentions had been He felt that he should have been permitted to bomb the concentrations of Chinese troops as they had massed across the Yalu during November 1950; he stated: "If I had been permitted to bomb them before they crossed the Yalu, they never would have crossed." Once the Chinese armies had crossed the Yalu and had entered combat in Korea as national entities, MacArthur would have cut off their logistical supply by bombing their Manchurian supply lines and bases that contributed to the actual battle front.[16]

At least one other high ranking officer held the same views on bombing the Chinese. In his statement to the investigating committee on 21 June 1951, General O'Donnell noted that he had been greatly in favor of bombing the Chinese Communists in Manchuria at the time that they entered the Korean combat:[17]

> I was all for the bombing of Manchuria, and I wanted very badly to do it as soon as we recognized the Chinese Communist forces . . as bona fide forces.
>
> That was back in November. I think we could have hurt them a great deal, and I think that we should have done it I know I am speaking beyond my position as bomber commander, but I thought we ought to punish those people and let them know they can't come in as an aggressor and get away with it.
>
> At that time they had very little good fighter cover—I am talking about the Chinese. Their antiaircraft was not too good, and I think we could have gotten in and for very small cost in casualties we could have really hit them hard and perhaps even stopped them

By June 1951, however, General O'Donnell thought that Chinese air opposition had increased so markedly that there was question in his mind whether the USAF could then bomb Manchuria "and still retain the Sunday punch for Russia in case they get out of bounds."

The United States Position on Korea: From the beginning of the Korean conflict the

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United States had made a conscientious and determined effort to localize this unfortunate fighting, and the restrictions placed upon the conduct of military operations in Korea had represented the views of the U.S. Joint Chiefs of Staff as expressed and discussed in the National Security Council with the representation and presence of the President, the Vice President, the Secretary of Defense, the Secretary of State, and the head of the National Security Resources Board. The restrictions had represented an intermingling of political necessities along with military considerations. Politically, the restrictions derived from the necessity that the United States pursue a course of action which would not rupture its relations with its friends in the United Nations. There was no doubt of the British position regarding the war in Korea· "Our view," stated Prime Minister Clement R Attlee, "had always been that the Far Eastern war should be confined to Korea and Asia."[18] The reason held by the U.S. State Department for opposing the bombing of Manchuria was that "to do so would, we believe, increase—and materially increase—the risk of general war in the Far East and general war throughout the world."[19]

Aside from these political reasons, there were sound military reasons why the United States could not in the winter of 1950–1951 undertake air operations against Manchuria or China. These reasons were best described by General Vandenberg:[20]

> Air power, and especially the application of strategic air power, should go to the heart of the industrial centers to become reasonably efficient Now, the sources of the materiel that is coming to the Chinese Communists and the North Koreans is from Russia. Therefore, hitting across the Yalu, we could destroy or lay waste to all of Manchuria and the principal cities of China if we utilized the full power of the United States Air Force. . In doing that, however, we are bound to get attrition. If we utilize less than the full power of the United States Air Force, in my opinion it might not and probably would not be conclusive
>
> And even if we utilized it and laid waste to it there is a possibility that it would not be conclusive. But the effect on the United States Air Force, with our start from approximately 40 groups, would fix it so that, should we have to operate in any other area with full power of the United States Air Force, we would not be able to
>
> The fact is that the United States is operating a shoestring air force in view of its global responsibilities. .
>
> In my opinion, the United States Air Force is the single potential that has kept the balance of power in our favor It is the one thing that has, up to date, kept the Russians from deciding to go to war. . .
>
> While we can lay the industrial potential of Russia today to waste, in my opinion, or we can lay the Manchurian countryside to waste, as well as the principal cities of China, we cannot do both, again because we have got a shoestring Air Force

General Vandenberg believed that the use of the whole USAF could very well lay waste Manchuria and the principal cities of China but that the inevitable attrition incurred in such an effort would leave the United States "naked for several years to come." Substantially these same thoughts were incorporated in a JCS memorandum to the U S. Secretary of Defense on 3 January 1951· ". . . it would be militarily fool-hardy to embark on a course that would require full-scale hostilities against great land armies controlled by the Peking regime, while the heart of aggressive Communist power remained untouched."[21]

Holding to these viewpoints, the JCS remained unwilling to permit air attacks north of the Yalu River boundary of Korea. When General MacArthur reported gloomily at the end of December 1950 that it was quite probable that UN forces would have to be withdrawn from Korea, the JCS directed him on 29 December to conduct a ground defense from successive positions and to inflict such damage on the enemy as was possible, subject always to the primary consideration of the safety of the forces under his command.[22]

The Question of Employing Atomic Weapons: In reply to a question put to him at a press conference on 30 November 1950, President Harry S. Truman stated that the United States would take whatever steps were necessary to meet the military situation in Korea, including the use of every weapon which was possessed. He stated that active consideration had been given to the use of atomic

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bombs, but that he did not want to see them used especially against innocent people who had nothing to do with military aggression. President Truman said further that use of atomic weapons did not depend upon the United Nations but upon the military commander in the field. Later that day the White House issued a statement saying that only the President could authorize the A-bomb's use and that he had not done so thus far.

This statement caused wide repercussions in Europe, especially in Great Britain and France. Fearing that there had been some divergence of views between his nation and the United States, Prime Minister Attlee held conferences with French Premier Rene Pleven in London and on the evening of 3 December departed by air for Washington. The Truman-Attlee talks began on 4 December, and in the course of them Attlee was assured that the United States did not wish to extend the Korean conflict. Regarding the use of atomic weapons, the British position was that A-bombs should not be used without consultation, and probably without agreement, with them and perhaps others. On this matter, President Truman apparently stressed a desire and expectation to move in step with the British, a desire not to employ atomic weapons, and a realization of the gravity of the situation which might result if the weapons were used, but he refused to make commitments restricting the action of the United States.[23]

That the United States seriously considered the use of atomic weapons in Korea during December 1950 is doubtful, but certainly whatever effect the threat of atomic reprisal might have had on the Chinese Communist intentions in Korea was now lost because of a general press reporting that the atomic weapons would not be used. During this month in Korea there was some thought as to the practicability of using atomic weapons: the Eighth Army staff was reported to be in favor of their employment and the Fifth Air Force saw no reason why it could not mark targets for an atomic strike, provided that proper targets could be located, which, as has been seen, was proving somewhat difficult with the limited amount of reconnaissance aviation possessed. In fact, the Fifth Air Force staff thought that once enemy concentrations were located they would be destroyed with conventional weapons.[24]

A theoretical study undertaken by an Army research organization later demonstrated that defective ground and air intelligence regarding Communist troop movements and concentrations would have limited the destructivity of atomic weapons had they been tactically employed against hostile personnel targets On the contrary, had intelligence been better, atomic weapons might have taken a terrible toll of hostile troops If one 40-kiloton air burst weapon had been exploded over the dense enemy concentration in the Taechon area on the night of 24/25 November 1950, the study estimated that 15,000 of a total enemy force of about 22,000 troops would have been destroyed, but the time required to confirm the intelligence and deliver an attack probably would have prevented exploitation before this target moved on the next night Estimated enemy casualties from six 40-kiloton air-bursting bombs over the fairly extensive CCF and NKPA assembly in the Pyonggang-Chorwon-Kumhwa triangle on 27 to 29 December 1950 would have amounted to some 30,000 to 45,000 of a total enemy force of about 65,000 to 95,000, but here again friendly intelligence regarding enemy numbers was somewhat inexact and was received while the target was dissipating Had six 40-kiloton bursts been laid along the enemy lines north of the Imjin River on the night of 31 December/1 January 1951 an estimated 28,000 to 40,000 of a total enemy force of 70,000 to 100,000 in the area preparing for a jump-off assault against the Eighth Army would probably have been destroyed. On 7 and 8 January 1951 two 40-kiloton bursts against NKPA concentrations against the Wonju salient would have eliminated 6,000 to 9,000 of a total enemy force of 18,000. In these latter two cases the Communist positions were sufficiently close to Eighth Army troops so that friendly troop losses from the atomic strikes would have been from 1,000 to 1,200 killed and an equal number wounded per atomic warhead expended.[25]

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Lessons from the CCF Third-Phase Offensive: Actually it would appear that no small amount of the pessimism rampant in the UNC during December 1950, leading to talk of bombing Manchuria and China, withdrawal from Korea, and atomic weapons employment, was born of a refusal to grasp the fact that the Chinese "hordes" could be and were then being defeated. Although FEC intelligence carefully recorded the reports of air destruction in North Korea during December 1950 and credited large casualties against the Chinese it cautioned that: "With a reserve strength of several hundred thousand trained troops in Korea or the immediate proximity and an almost bottomless well of manpower potential, the over-all effect of the losses on the current operation of the CCF is almost negligible." [26] Speculating as to why the Communists did not attack during December, the FEC intelligence journal observed that: "The Chinese Communists in the past have frequently been known to delay an offensive until they had secured odds of three or four to one against the enemy." [27] What was not recognized was that nearly two months of air attacks against the Chinese Communist forces to the rear of the battle lines would have taken away much of their combat punch by the time that they maneuvered into position for renewing the ground war at the 38th parallel.

The Communist third-phase offensive developed in a manner much according to the predictions of UN intelligence. Obviously selecting a period of bad forecasted weather (Korean weather moves from northwest to southeast during the winter and the Chinese could take advantage of their foreknowledge of climatic conditions to begin their offensive during a period of poor flying conditions),[28] the Reds broke through the ROK 9th Division in the central Korean mountains on 29 December to begin a wide envelopment of the Eighth Army. And on 31 December they launched a 9-division main thrust southward across the Imjin River against Seoul. Eighth Army forces fell back to a Seoul bridgehead line, but by 4 January 1951 they were forced to evacuate the South Korean capital and take up a line along the southern bank of the frozen Han River. Continued enemy pressure down the enveloping salient debouching from the central Korean mountains at Wonju made the Han line untenable, and on 6 January the UN forces abandoned Suwon and its airfield, taking up prearranged positions along a defense line which ran across the peninsula through Pyongtaek, Ansong, Chaeng-ni, Wonju, Hungjong-san, Turo-bong, to Wonpo-ri. The heaviest fighting centered about Wonju, and the town changed hands several times before it returned to UN control.[29] After a five-day offensive, the Chinese suddenly ran out of power and permitted, by 7 January, the establishment of the new UN defense line from Pyongtaek through Wonju (although fighting continued in this area) to the east coast.

While the Eighth Army rolled before the weaker-than-anticipated Communist offensive, UN air defied exceedingly bad weather—low ceilings with rain and snow storms—to contribute heavily to the stemming of the Red "human wave" attacks. Preparatory to the effort a FEAF-NAVFE conference on 27 December had agreed that Task Force 77 carrier-based aircraft would give close support to the eastern half of the battle front, with the Navy pilots to be prebriefed for armed reconnaissance in the event that they failed to secure close-support targets from ground controllers.[30] Fifth Air Force fighter-bombers carried the close-support load on the western portion of the battle line, furnishing an average of 104 close-support sorties each day between 31 December and 15 January. They gave 258 close-support sorties on 1 January when Eighth Army was especially hard pressed, and only on 10 January, when low clouds and continued snow and rain kept most aircraft on the ground, were the fighters unable to provide ground support.[31] On this day, fortunately, the front-line fighting was generally quiet. During the enemy offensive, targets for the fighters were once again plentiful, and the Chinese Communist forces suffered tremendous losses from strafing, rockets, and napalm. An estimated 500 enemy troops were killed by fighter attack in the area 3 to 4 miles northwest of Seoul on 4 January; air attacks killed an estimated 100 enemy 6 miles north-

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west of Hoengsong on 6 January; next day fighters slaughtered 150 to 200 enemy northeast of Hoengsong and 60 near Wonju; and on 13 January UN aircraft inflicted some 150 casualties on enemy troops moving south from Kangnung and assisted Eighth Army troops in breaking up a "banzai-type" attack against Wonju.[32]

Other air units also contributed destruction to the Red Chinese aggressors Night-flying B–26's of the 3d Bombardment Wing continued close-in attacks against the enemy, and on 2 January the wing instituted use of C–47's for dropping flares over the battle line,* an improvisation which enabled the B–26's to give their full attention to low-level work, assisted friendly artillery to fire on otherwise obscure targets, and generally held down enemy night movement.[33] Bomber Command also attempted strikes which were requested by Fifth Air Force and Eighth Army. Two tarzon-carrying B–29's tried to break the Hwachon dam in the hope of raising the water level and breaking the ice on the Han and Pukhan rivers; on 7 January weather prevented visual bombing, and on 8 January only one tarzon bomb responded to control and it proved insufficient to the task.[34] Requests that the B–29's attack Kaesong and Wonju required clearance from General MacArthur because the towns were in South Korea, but on 12 January the decision was made that tactical targets in South Korean cities could be attacked,[35] and that same day, 10 B–29's laid their bombs on Red troops holding Wonju in the see-saw battle raging about that town.[36]

In the short but intensive fighting between 30 December and 25 January, FEAF airmen claimed destruction of 8 tanks, 26 field guns, 484 vehicles, 11 locomotives, and 137 railway cars, and estimated that they killed 18,829 enemy troops.[37] Prisoners taken during the period confirmed the destructiveness of the air attack and credited UN air with not only cutting off their supplies but with inflicting some 50 per cent of the total casualties suffered by their units.[38]

*See Chap VI, pp. 165–67.

With the exception of the especially requested battle area targets, the FEAF Bomber Command continued its work behind enemy lines. In recognition of Pyongyang's importance as a key supply and communications center and as Communist headquarters, Bomber Command sent massive B–29 strikes there on 3 and 5 January. Although weather hindered these missions and snow-covered roofs on the buildings reduced the effects of the incendiaries employed, at least 35 per cent of the North Korean capital was destroyed.[39] After these two maximum efforts, Bomber Command was directed to destroy railroad bridges in extreme north-central Korea and similar bridges, marshalling yards, and rail facilities along the west coast; at Bomber Command's suggestion that marshalling yards would provide more lucrative targets than bridges as long as the ground and rivers remained frozen, FEAF directed on 9 January that one-third of the B–29 effort would attack marshalling yards, using a high percentage of variable-delay bombs.[40] After 14 January FEAF placed almost all of the B–29 effort upon interdiction targets, simultaneously requesting that NAVFE aircraft undertake rail cuts on the east coast rail lines between Hamhung and Kosong.[41]

Considering the fact that the loss of Kimpo forced the withdrawal of 4th Fighter-Interceptor Wing Sabres to Japan it was well for the UN cause that the Communist MIG–15's stood down during the Communist New Year's offensive. To make certain that the Red air force was held at bay, B–29's cratered Kimpo airfield (K–14) on 8 January and Pyongyang airfield (K–23) on 23 January, seeding in delayed-action bombs to curtail repairs.[42] The Red air force surged back into action on 14 and 15 January, making a few attacks against UN front-line troops.[43] Thereafter during January the MIG's were active, and on 21 January Lt. Col. William E. Bertram scored the first F–84E victory by shooting down a MIG–15. On 23 January, in the largest all-jet battle to that date, 33 F–84's escorting B–29's near the Manchurian border engaged about 25 MIG's, destroying 3, probably de-

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stroying 1, and damaging 3 others, without the loss of F–84's.[44] While the MIG force lacked sufficient aircraft at this period to inflict too much damage, it nevertheless dominated the northwest corner of Korea down to the Chongchon River.

At the same time that the Communist offensive overran the UN airfields at Seoul and Suwon, the Eighth Army found even greater need for the airborne supplies which previously had been laid down at these airheads. The only advanced fields into which FEAF Combat Cargo Command could operate C–54's and C–119's were Taegu (K–2) and Pusan (K–9). The strip at Taejon (K–5) could be used by the larger transports only when it was completely frozen, and, after a few thawing days caused a serious C–54 accident on 14 January, the field had to be closed to planes heavier than C–46's and C–47's. Since the capacity of the air transport fleet now exceeded the capacity of Korean fields at a time of great need for air supply, a number of temporary airstrips were readied wherever terrain permitted. Fresh from its experience around the Choshin Reservoir, X Corps scraped out strips at Wonju, Chungju, and Andong, and, balancing the hazard against the urgency, Combat Cargo Command flew C–46's and C–47's into the strips. Such a calculated risk cost six C–46's destroyed in landing supplies at Chungju. Still a larger amount of aerial supply was required, and other ground units, denied normal supply by guerrilla activities against their lines of communications, requested emergency airdrops. Prior to 31 December 1950 in all of its activity, Combat Cargo Command had airdropped only 3,275 tons of supplies, but in the period of 1 through 24 January 1951 it utilized 406 C–119 sorties to airdrop to X Corps some 2,007 tons of supplies. The largest portion of these supplies was dropped to the mountain-fighting X Corps units and included POL products, with rations, ammunition, and unit equipment following in order.[45] In addition to the airdropped supplies, Combat Cargo Command moved 5,041.2 tons to Fifth Air Force and 7,445.3 tons to the Eighth Army during the first 24 days of January, and upon their return trips from Korea the transports evacuated 10,489 combat casualties.[46]

While the fighting during the Communist third-phase offensive had been hard, the success in dealing with Red massed-manpower attacks lent confidence to the UNC. Ground-oriented commanders now began to grasp the fact that relentless UN air attacks at the rear of the Communists deprived these masses of manpower of their logistic support and their mobility, as well as taking great numbers of personnel casualties. Over a period of time the trickle of Red supplies which got through would build up at their front lines and enable the Communists to launch short and fierce ground offensives, but each time that Red troops and vehicles came out into the open in an offensive they could be subjected to heavy casualties by combined ground and air attack. Chinese manpower potential, moreover, was no "bottomless well," for the Chinese were using up their best armies in a fruitless effort to overwhelm the UN forces in Korea. While they might be able to replace men as bodies they could not replace the trained soldiers which they were losing. Benefited by air superiority, airdropped supplies, and general ground mobility, the UN ground forces possessed an ability to maneuver on the most favorable circumstances against the Communists, trading space for Communist casualties.

When Generals Collins and Vandenberg visited Eighth Army headquarters on 15 January 1951 they found that as a result of the radical change in viewpoint Eighth Army was no longer planning an evacuation from Korea but a series of limited offensives. General MacArthur was nevertheless promised reinforcements in the form of the deployment to Japan of two partly trained National Guard divisions. On 20 January, General Ridgway announced his plans to depart from a surface-oriented strategy of taking and holding ground: he intended that strong armored counterattacks, supported by infantry, artillery, and air, would be executed at every

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opportunity with such strength as capabilities and the tactical situation would permit His purpose was to inflict on the enemy maximum personnel and materiel losses consistent with maintaining all major UN units intact.[47] This decision on the part of Eighth Army to maximize the destructivity of its capabilities in a series of limited offensives came shortly before the Chinese apparently recognized the vulnerability of their situation, but, according to UNC intelligence reports, General Lin Piao as early as 5 February stated his intentions to move his Fourth Field Army back to strong fortifications north of the 38th parallel, his reasoning being predicated upon an impossible supply position and the inability of his forces to cope with the UN air superiority.[48]

THE AIR CAMPAIGN AGAINST THE COMMUNIST ARMIES

Problems of Air Operations: Loss of ground to the Chinese Communist offensive early in January 1951 forced the Fifth Air Force backward to the same bases which it had used during the high tide of Communist aggression in the summer of 1950, and for a short time it appeared that the whole Fifth Air Force might be forced to evacuate to Japan. Prior to the enemy drive into the Seoul-Inchon area, however, heavy equipment and items of supply had been evacuated, and little critical material remained at Inchon and Ascom City on 5 January when the Navy forces demolished the port and withdrew. At Kimpo the 4th Wing's F-86's were flown out on 2 January, and by midday on 4 January the 51st Fighter-Interceptor Wing abandoned Kimpo. Loss of Suwon airfield (K-13) on 6 January deprived the 18th Fighter-Bomber Wing of its forward staging base; its crews left Suwon on 5 January and flew thereafter during the month from Chinhae (K-10).[49] The airfield at Taegu (K-2) was once more the most advanced facility still available, and the security of this airfield was none too certain

Following a FEAF directive to prepare evacuation plans, the Fifth Air Force intended, if Taegu had to be given up, to establish an operational echelon at Pusan and a rear echelon in Japan[50] All subordinate air units drew up operations plans for such a withdrawal, and the Fifth Air Force began to evacuate units and heavy equipment from Korea The 543d Tactical Support Group, newly created as the tactical reconnaissance organization, began to move all personnel and equipment not essential to combat from Taegu to Komaki on 12 January,[51] between 24 and 31 January the 27th Fighter-Escort Wing detachment moved from K-2 to Itazuke;[52] and the 49th Fighter-Bomber Wing on 26 January simultaneously announced the opening of a staging detachment at K-2 and the movement of wing headquarters to Tsuiki airfield in Japan[53] The primary mission of this staging detachment at K-2 was to refuel and rearm all fighter aircraft operating there; in case of an enemy attack the smaller detachment would be much less vulnerable than the 49th Wing.[54] At Pusan East airfield (K-9) the 35th Fighter-Bomber Wing evacuated its heavy equipment and supplies. At the end of January only the two F-51 wings remained in Korea: the 18th at Chinhae (K-10) and the 35th at Pusan East (K-9), and according to a mid-January plan, these two wings would have reduced their base service strengths to refueling and rearming detachments by 1 February, preparatory to their evacuation on 24-hour notice; but the note of optimism induced by the clearing ground situation caused General Partridge to leave the two wings in place for the time being. Thus in February 1951, as had been the case during the battle for the Pusan perimeter the year before, the mass of Fifth Air Force combat strength was based in Japan: the 8th and 27th Wings at Itazuke, the 51st Wing at Tsuiki, the 4th Wing at Johnson, and the 3d and 452d Bombardment Wings at Iwakuni and Miho. (See figure 8.)

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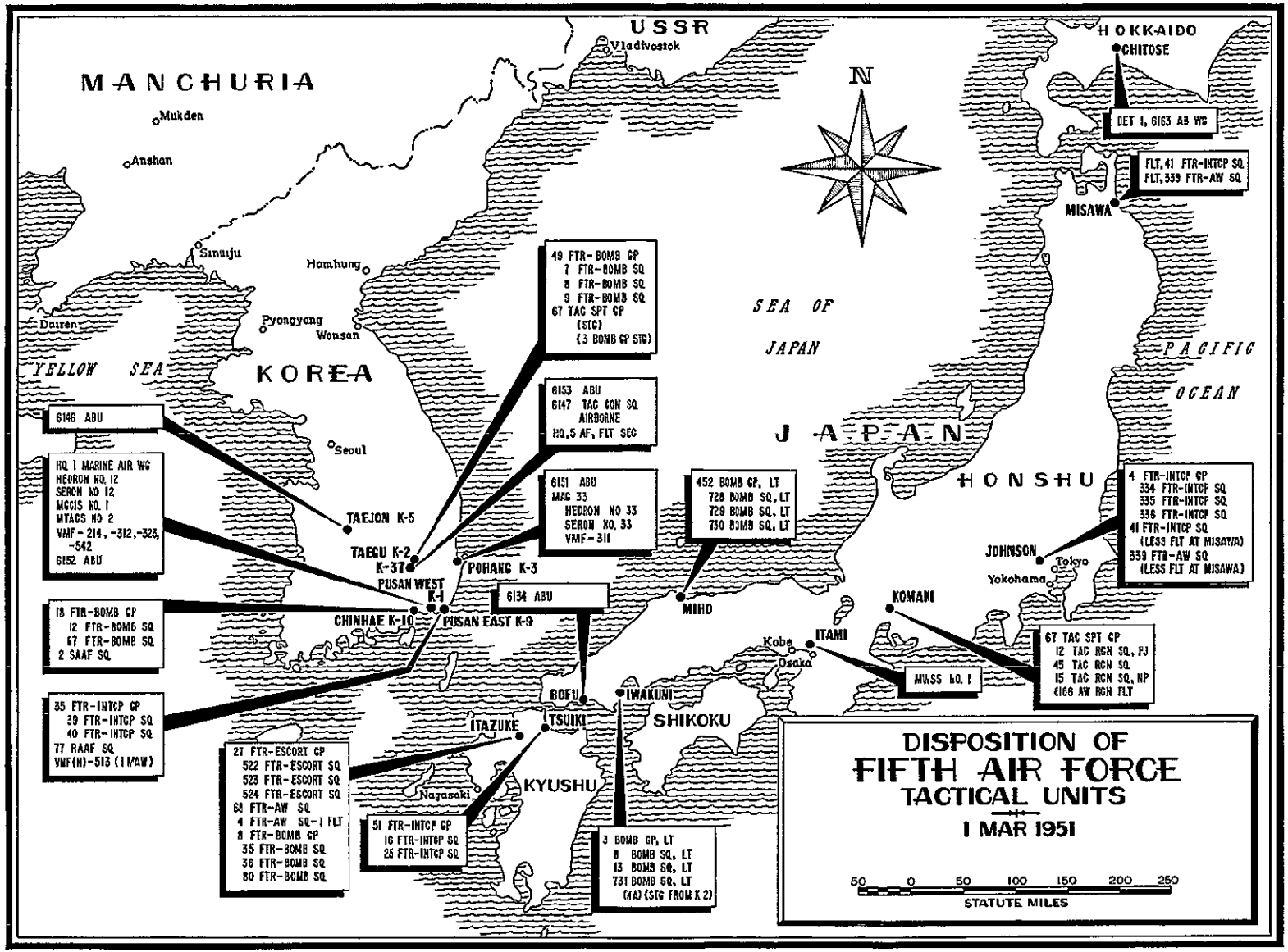


Figure 8

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Prosecution of air attacks against Korean targets from Japanese bases again introduced many of the operational problems already encountered during the autumn campaigns of 1950. Although the 27th Fighter-Escort Wing found the runways, buildings, and maintenance facilities at Itazuke far superior to those at Taegu, the additional 190 miles distance from the target area seriously impaired the combat efficiency of its F–84 group. The range versus armament problem was partly solved by carrying one pylon tank on the right wing, and after some experimentation a standard loading became 150 gallons of fuel in a pylon tank and one 110-gallon napalm tank. Early in February, armed-reconnaissance missions commonly carried 150 gallons in pylon and two 5-inch HVAR's or one 110-gallon napalm tank; short armed-reconnaissance or close-support missions carried 150 gallons in pylon, one 110-gallon napalm tank, and two 5-inch HVAR's; while escort missions carried 300 gallons in pylon tanks. Increasing runway temperatures, however, lengthened take-off distances to the extent that the pylon fuel load had to be cut to 100 gallons, and at the end of February the pylon tanks had to be removed from all F–84's loading external armament, thus reducing the group's range.[55]

Flying from Itazuke and Tsuiki, the F–80 groups encountered similar problems of range and armament loading. Over 85 per cent of the 8th Fighter-Bomber Group's flying was being done between the front lines and the operating base, and its armament load was necessarily diminished by the fuel required to get the aircraft to the target area and back. At Tsuiki the 51st Fighter-Interceptor Wing had additional hardships, for the base was "an old, demolished Japanese airfield," and not until May would the runway be extended to 7,000 feet. As the spring weather grew warmer, JATO was required to get the F–80's airborne and the resultant smoke imperiled formation take-offs.[56]

Range problems necessarily limited the time which a Japanese-based jet fighter was permitted to spend in a target area, not only hindering the identification of obscure objectives but leading to inefficient expenditure of ordnance. Early in March, for example, the 27th Wing computed that its pilots were expending an average of only 54.9 per cent of the 50-caliber ammunition which they carried on missions and speculated that a large proportion of the ammunition actually fired was probably ineffective due to haste in firing and long bursts necessitated by the short time in the target area. The only practical solution was to emphasize the employment of munitions which could be speedily launched,[57] and thus during March the 27th Wing emphasized napalm, employing a more efficient 90-gallon napalm tank to drop 1,028.2 tons of the incendiary during that month.[58]

While the Japanese-based jet fighters were meeting range difficulties, the 49th Fighter-Bomber Group which had remained at Taegu continued to get off maximum-effort strikes, and at the close of January the group broke its own and the Fifth Air Force sortie record with 2,613 effective sorties for the month. But February was a month of bad weather, many accidents, and few sorties at Taegu. The heavy January ground fogs, which had limited operations after 1700 hours each day, gave way to solid fronts in February which closed the field completely on three days and two mornings. Caught in marginal weather which rapidly went worse on the morning of 21 February, five F–80's had to make emergency landings in central Korea, three making wheels-up landings in the Naktong River. That month the 49th Group got off only 1,835 effective sorties.[59] On 23 February, however, most of the 49th Wing returned to Taegu from Tsuiki, thus improving the K–2 logistical establishment,[60] and the improved weather of March allowed the 49th Group to dispatch 2,167 effective sorties.[61]

Despite the unfavorable weather which hampered air operations at Taegu, the Fifth Air Force during February had little choice but to utilize it as a staging base for missions to the forward battle areas. All through January the 3d Bombardment Wing had continued to stage its night intruding B–26's through the airfield, defying the PSP runway sections which regularly cut up the bombers' tires and on occasions sprang up in the path

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of aircraft on take-off.[62] Although it was well recognized that the two 4,600-foot PSP strips and the rocky taxiways would further deteriorate under increased usage,[63] the 8th and 51st Fighter Groups began rearming and refueling their F-80's at K-2 on 1 February. Each flight would take off at Itazuke or Tsuiki; fly a mission; and land at Taegu for briefing, refueling, and rearming; fly a second mission; and then return to their home base. Occasionally, if the second mission was a particularly long one, the flight would land at K-2 for internal refueling before returning to Japan. In the beginning, the refueling and rearming was done by personnel of the 49th Wing who managed to turn around an average of 60 sorties in approximately 6 hours of each day,[64] but in March personnel of the 8th and 51st Wings was integrated into the refueling and rearming detachment, which now "was no longer an experiment but a much used, high performance operation." Working 16 hours a day, the detachment serviced nearly 2,000 aircraft during the month.[65]

On the last day of February the 35th Fighter-Interceptor Group also opened a staging detachment at the recently-recaptured Suwon airfield (K-13) which comprised two to four aircraft each from the 39th and 40th Squadrons and the necessary pilots and ground crews to fly, maintain, rearm, and refuel the F-51's. At the latter part of March, this detachment was stabilized at eight aircraft with an expected sortie rate of four per day per plane, and the squadrons rotated planes and pilots every three days and ground crews weekly. This staging arrangement moved the Mustangs nearly 200 miles closer to the front lines and in several instances of bad weather in the rear areas, only the Suwon-based Mustangs were able to furnish emergency close support. Flying four missions a day often into the same target area, the pilots become familiar with the terrain and could readily locate ground targets.[66] On 17 March the 68th Fighter All-Weather Squadron also began staging one F-82 night fighter into Suwon each evening for strip alert and air patrols over Seoul.[67]

These staging operations enabled the Fifth Air Force to fly more missions with fewer aircraft, but they were recognized as temporary expedients, useful only until tactical units could be returned to Korean airfields. Beginning on 15 March, the 67th Tactical Reconnaissance Wing and Group, with the 12th, 15th, and 45th Squadrons (the new reconnaissance establishment having been formed on 25 February with the redesignation of the 543d Tactical Support Group and the 162d and 8th Tactical Reconnaissance Squadrons) joined their combat echelons at Taegu.[68] As a matter of urgency, late in February two 4th Fighter-Interceptor Wing Sabre squadrons were dispatched to Korea, the 334th being temporarily located at Taegu and the 336th based at Suwon.[69] The existing airfield complex in Korea during February and March could accommodate no additional air units.

Efforts to Maintain Air Superiority: The problem of Fifth Air Force deployment adversely affected the maintenance of UN air superiority, especially over northwest Korea. When 4th Wing Sabres had to be withdrawn to Japan, the MIG forces, gaining in numbers and aggressiveness, dominated as much of northwest Korea as they could cover with their limited range from their operational bases around Antung. MIG's now harried interdiction efforts and attacked the RF-80's as they dashed in to photograph Yalu River objectives.[70] With its limited counter-air capability, the Fifth Air Force claimed only one enemy aircraft destroyed in February, this lone victory being scored against a YAK-9 fighter by a 67th Fighter-Bomber Squadron F-51 pilot, who pulled up from a strafing pass against some railway cars near Pyongyang to encounter the Russian-built conventional fighter in front of him and ready for destruction.[71]

Although the F-80 jet fighters were clearly out-classed by the swept-wing MIG-15's, 8th Fighter-Bomber Group pilots, who drew most of the escort duty, claimed all of the Fifth Air Force's four MIG-15 kills in March, one of which resulted from a head-on crash between a MIG and an F-80 with the destruction of both aircraft. In another air battle

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By continuously attriting the enemy's transport forces and by compelling the Communists to move at night under tortuous road and rail conditions, the UN air forces were obviously denying the Reds a large portion of the logistics which they required. That the attacks against enemy communications routes was hindering the build-up of troops and supplies for any major Communist ground offensive was further attested by a captured political report of the Chinese 35th Division This division crossed the Yalu on 21 March and experienced a hectic 19-day march to the front: on account of frequent air attacks many soldiers were worn out digging shelters; air raids caused consternation and casualties and increased an already serious straggling problem. Frequently the troops were unable to obtain food for two or three days, the whole result being that when this division reached the front lines it was already suffering from combat fatigue.[91]

COORDINATED AIR-GROUND OPERATIONS AGAINST THE COMMUNISTS

The Pattern of Air-Ground Attack: With counter air operations neutralizing the enemy threat from the air and air interdiction operations weakening the enemy situation on the surface, conditions in Korea at the end of January 1951 were propitious for UN air-ground attack Despite an emphasis upon interdiction and armed reconnaissance—which both assisted the ground attack and deprived the Communists of the logistics needed to support their defense—the Fifth Air Force worked in close coordination with Eighth Army: FEAF aircraft flew 3,255 close-support sorties in February and 5,901 in March, the latter total being theretofore exceeded only in August and September 1950.[92] At the same time that air action paralyzed the mobility of the Communist armies, air-delivered and airdropped supplies permitted Eighth Army units great freedom of maneuver

At General Ridgway's order, the U.S. I and IX Corps on 25 January initiated operation THUNDERBOLT, designed as a reconnaissance in force which, if enemy resistance proved weak, would also clear the area south of the Han River. Within a day the 25th Division had reached Suwon, and on 30 January the C–46's of the 61st Troop Carrier Group were the first to land at the recaptured Suwon airfield, transporting some 270 tons of vital army supplies there during the first day of operations.[93] At the end of January the U.S. X Corps and ROK III Corps instituted operation ROUNDUP which drove northward against the rejuvenated NKPA II and V Corps, now holding the enemy lines in the central Korean mountains. Successes of the X Corps against stiff resistance permitted further advances in western Korea as the danger of a Communist flanking attack was mitigated; the U.S. 25th Division resumed its offensive on 10 February, reoccupying Kimpo and Inchon during the day without appreciable enemy opposition.[94] A month before, these facilities had been thoroughly demolished at the UN withdrawal, and repairing the Seoul area airfields and the port of Inchon would require many weeks.

The Communists were evidently suffering from a shortage of logistics and the Eighth Army ground operations had thrown them off their balance, for when on the night of 11/12 February they launched their fourth-phase offensive, it was evidently premature.[95] The Reds nevertheless unleashed a violent attack against X Corps along the Hoengsong-Wonju axis and in the Chipyong area, where for three days surrounded elements of the U.S. 2d Division resisted fiercely until relieved by an armored column. The surrounded units—the U.S. 23d Infantry and the French battalion—received 87 C–119 loads of airdropped ammunition, gasoline, and rations in the three days 14 through 16 February.[96] The sharp fighting around Chipyong also demanded strong air support from Fifth Air Force fighter-bombers: Maj. Gen. Clark L. Ruffner, commander of the 2d Division, later wrote General Stratemeyer that after one

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napalm attack against the reverse slope of the final hill leading into the perimeter he had seen more enemy dead than he had ever witnessed before.[97] Heavy fighting also took place north of Chechon, east of Wonju, and south of Chongson, but by 24 February the X Corps was driving the enemy northward.[98] This Communist offensive failed to dislodge the I and IX Corps from their gains along the Han River. After the February Communist offensive was repulsed General Almond expressed the appreciation of X Corps for the continuous and effective air support rendered by Fifth Air Force: "Nothing is more heartening to the front-line soldier," he stated, "than to observe such striking power as was displayed in the X Corps area." [99] General MacArthur also thought of the value of the air-interdicted Red supply lines· "The enemy," he observed, "is finding it an entirely different problem fighting 350 miles from his base than when he had sanctuary in his immediate rear." [100]

On 21 February General Ridgway effected operation KILLER, an attack designed to destroy hostile forces east of the Han River, with the main efforts along the Wonju-Hoengsong and Yongwol-Pyongchang axes. Spearheaded by the rejuvenated 1st Marine Division, the central Korean assault registered steady initial gains, but early spring rains and thawing severed rail and highway communications leading into the IX and X Corps areas, jeopardized further progress.[101] The 314th Troop Carrier Wing was therefore heavily committed to the support of troops north of Wonju, between 23 and 28 February, this wing dropped 1,358 tons in 265 C–119 loads in the area. On 24 February a record for drop tonnage was set when 67 C–119's dropped 329.1 tons to the 1st Cavalry Division at Koksu-ri and to the 1st Marine Division at Wonju and two C–46's dropped four tons of rations to the 2d Division at Puphong-ni.[102]

Instead of trying a costly frontal attack against Seoul, Ridgway on 7 March instituted operation RIPPER, which placed the main avenue of attack along the axis Hongchon-Chunchon. Elements of the 25th Division crossed the Han near its confluence with the Pukhan River on the first day of the offensive, and in three days of savage fighting the enemy was driven northward in disorder. Simultaneously, the 1st Cavalry and 1st Marine Divisions aimed a double envelopment at Hongchon, and on 12 March enemy resistance suddenly began to crumble. Hongchon fell on 15 March, and on the night of 14/15 March the Chinese, evidently fearing an Eighth Army flanking attack, abandoned Seoul without a fight.[103] By 18 March the Reds were attempting to withdraw their forces on all fronts. When the Communists panicked, close air support strikes took heavy casualties: in mid-March four F–84's and eight F–80's worked over an estimated 1,200 enemy troops spotted for them by a Mosquito controller, and when the UN ground troops took the position they found 600 dead and 300 wounded.[104] Observed General MacArthur on 24 March: "It is increasingly evident that the heavy destruction of the enemy's lines of supply, caused by our round-the-clock air and naval bombardment, left his troops in forward areas deficient in requirements." [105]

The Airborne Attack at Munsan-ni: In the expectation of exploiting an enemy retreat Generals Partridge and Ridgway had been planning an airborne employment of the 187th Airborne Regimental Combat Team On 21 March Ridgway and Partridge alerted their forces for TOMAHAWK: the 187th RCT was to be dropped at Munsan-ni, a village lying athwart the Seoul-Kaesong road, to trap Communist troops being pursued northward out of the Seoul area by the U.S I Corps.[106]

In preparation for an earlier paradrop at Chunchon which had been canceled the 315th Air Division (Combat Cargo) had concentrated 75 C–119's of the 314th Troop Carrier Wing and 55 C–46's of the 437th Troop Carrier Wing at Taegu (K–2) on 21 March; here also was located the 187th RCT which had been withdrawn from the Eighth Army line early in March for refresher airborne training. Serials had been loaded for the Chunchon drop, but because of the severe dust at Taegu no preflight run-ups of the transport

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engines were possible after the aircraft had been parked on their dispersals. At approximately 1200 hours on 21 March, Brig. Gen. John P. Henebry, commanding the 315th Air Division, received planning information that the 187th would be airdropped at Munsan-ni on the morning of 23 March. General Henebry and his two wing commanders, accompanied by Brig. Gen. Frank S. Bowen, commander of the 187th RCT, made a late afternoon visual reconnaissance of the objective area, and at 1730 hours they met with Generals Partridge and Ridgway to confirm D-day as 23 March and to set H-hour at 0900 hours. Recognizing the impossibility of any considerable changes at such a late date, Henebry and Bowen drew their plans so as to utilize the serials and loadings already set up for the canceled Chunchon operation.[107] Since as many as 12,000 North Korean troops were thought to be in the Munsan-ni area, emphasis was placed upon the necessity of getting the 187th RCT on the ground in two drop zones as speedily as possible.[108]

Weather on the morning of 23 March was perfect for the operation, and for 30 minutes before jump time the Fifth Air Force used 56 B–26's of the 3d and 452d Bombardment Wings to soften up the objective areas with 500-pound air-burst bombs and "ramrod" low-level strafing and rocketing attacks.[109] Sixteen F–51's flew escort for the transports, and other fighters under direction of a Mosquito airborne controller gave support during the day. General Ridgway said it was the best fighter support he had seen on any airdrop.[110]

At Taegu dust made transport take-offs hazardous, but pilots maintained ten-second intervals and no one got into trouble. Over the drop zones during the day, five serials of transports launched their paratroopers and dropped their equipment without difficulty. Only one of the six serials went astray after its lead plane aborted, the mishap taking place as follows: shortly after take-off the lead C–46 in the second serial had mechanical difficulty (the only plane of 119 participating to abort) and had to turn back to the alternate airfield at Taegu South (K–37). The deputy leader took over, but when his heavily loaded C–46's were unable to keep up with the proper timing, he elected to skip the IP and head directly to the south drop zone. Due to error in low-level navigation, however, the leader missed his assigned zone and dropped a battalion of paratroopers into the north drop zone. In the meantime, the regular serial commander at K–37 secured a spare C–46 and, at the insistence of the battalion commander who was on his plane, proceeded to the south drop zone where he dropped the battalion commander and staff. Had the enemy opposition been up to the caliber expected, the 30 men dropped on the south zone would doubtless have been casualties, but, as it was, General Bowen was informed of the situation and promptly sent a company down to retrieve them.[111]

Other than the misplaced battalion, the airborne operation went satisfactorily: 72 C–119's dropped 2,011 paratroopers and 204 tons of supplies and equipment, while 48 C–46's unloaded 1,436 paratroopers and 15.5 tons of ammunition, food, and signal equipment. During and immediately after the jump the 187th RCT suffered 84 jump casualties, 18 wounded, and 1 man killed by enemy action. Forty of the jump casualties were soon returned to action. During the operation five C–119's incurred minor damage from enemy small-arms fire, and one C–119, evidently because of enemy fire, broke into flames and crashed en route home, killing the pilot and copilot.[112] While the 187th RCT soon linked up with a tank battalion from Seoul, it remained so isolated from ground supply that air resupply drops on D plus 1, D plus 3, and D plus 4 were essential to immediately ensuing military operations. On 24 March, 36 C–119's dropped 40 personnel and 187.7 tons of supplies at Munsan-ni; on 26 March, 10 tons were dropped by 4 C–46's, and on 27 March, 65.8 tons by 12 C–119's. The last two days' drops were of vital importance, because the paratroopers, in a post-drop change of plans, had entered an area inaccessible to road supply; many of the men had received

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only a single meal in 36 hours, and one battery was down to 5 rounds of ammunition.[113]

A joint critique held on 3 April by the staffs of the 187th RCT and the 315th Air Division noted lessons which were to be drawn from this operation. The failure of the deputy leader of the second serial to drop at the proper zone was attributable only to human error, but General Henebry suggested that when enemy air opposition permitted, an airborne command ship, fully equipped for navigation and multiple-channel radio communication, should function as the drop-zone control ship during a paratroop operation. Henebry also recommended that a joint briefing of airborne unit commanders and serial leaders and deputies was necessary in order to give each a clear understanding of the other's specific tasks and problems. Because airborne troops were responsible for packing, loading, and ejection of cargo, General Bowen assumed responsibility for such malfunctions as had occurred in the heavy equipment drops; Bowen, however, stated that there was less damage than during the Sunchon-Sukchon drop and that much of this damage resulted from the use of parachutes recovered from the preceding airborne operation. As for aerial resupply, once paratroops had landed, Bowen believed that Rebecca-Eureka radio beacons would simplify the sometimes complex identification of drop zones. General Henebry recommended that a minimum of 24 hours be allowed for any change in the drop zone after the aircraft had been marshaled and that a minimum of 5 days' notice be given for alert, preliminary planning, and aircraft stand-down prior to laying on an airborne operation.[114]

While the airborne operation at Munsan-ni was a technical success, its tactical results in terms of enemy troops captured or destroyed were negligible. Enemy casualties following the airborne assault were estimated at 150 to 200 killed in action and 87 taken prisoner. Other operations incident to the establishment of perimeter defenses netted an additional 24 prisoners.[115] The area around Munsan-ni was held by a single regiment of the NKPA 19th Division, a second-rate combat unit. Prisoners captured by the UN paratroopers stated that as early as 21 March their regiment had received warnings from higher Communist levels that the 187th RCT would be dropped against Munsan-ni on 23 March; evacuation of the regiment had been ordered, but for some unknown reason had not been obeyed.[116] This statement, however, must have been in error since it implied that the Communists were exactly cognizant of UN intentions; what probably had happened was that the concentration of troop carriers at Taegu had been noted by Communist agents and a general alarm had been sent out to all forward Communist units that a paratroop drop was in the offing.

Initiation of MPQ–2 TADPOLE Operations: Ever impressed with the necessity of increasing the night air capability of his command and understanding the need of ground troops for close air support under conditions of night and all-weather, General Stratemeyer had announced that FEAF must find the control techniques necessary to such tasks. During January in Korea AN/UPN–4 ground-radar marking beacons were tested, but, while they provided the desired front-line demarcation for night close air support, the Fifth Air Force thought them generally troublesome and suggested the use of MPQ–2 radar.[117] The MPQ–2 was an improved model of the old SCR–588 gun-laying radar which had been used for blind-bombing control during the latter stages of the European campaigns of World War II,[118] and during the years following it had been developed for radar bomb-scoring purposes.* Three detachments of the SAC's 3903d Radar Bomb Scoring Squadron had been moved to Pusan in September 1950,[119] but they had been infrequently utilized in combat.

At the end of February 1951, tests suggested by General Partridge indicated that the MPQ–2 radars could satisfactorily control B–26 and B–29 aircraft in front-line night bombing attacks,[120] and beginning on 6 March, Bomber Command committed one or more of its B–29's to these MPQ–2 missions. Having

*See Chap VII, pp. 196-99 for a description of the TADPOLE control technique

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been designed to accompany the motor marches of antiaircraft artillery, the MPQ–2 radars possessed some degree of ground mobility and they were able to assume positions near the three U.S. corps headquarters; by the end of March one MPQ–2 detachment was north of the Han River with I Corps, and this corps was highly enthusiastic regarding this night bombing support, forwarding POW reports that such attacks caught enemy troops by surprise out of their fox-holes moving around.[121] Despite their theoretical mobility the other two MPQ–2 detachments were experiencing difficulties in finding suitable operational sites in the rugged terrain of central and eastern Korea.[122]

THE COMMUNIST SPRING OFFENSIVE

Intimations of Impending Communist All-Out Attack: Although enemy resistance stiffened as Eighth Army forces neared the 38th parallel, the ground fighting progressed satisfactorily so that by the end of March 1951 the main line of resistance ran generally from Munsan east through Chunchon to the vicinity of Hyon-ni, then northeast to Yangyang, which fell to ROK troops on 27 March.[123] In a few days more than two months, the UN coordinated air and ground action had driven Communist forces back to the 38th parallel UNC intelligence had received reports that the Chinese intended to defend the 38th parallel at all costs until May 1951, at which time (or earlier if their positions were jeopardized) they were going to launch an all-out spring offensive.[124]

In terms of climatic factors and the stiffening enemy resistance, the reports of an impending Communist spring offensive made sense. Inclement spring weather would favor the unmechanized, "on-foot" Communist armies, whereas atmospheric conditions—most suitable for aerial operations in winter—would become less favorable with the arrival of spring and summer rains and cloud cover. Without any precise information at hand, the Eighth Army expected the Communists to launch their fifth-phase offensive at any time between 20 April and 1 May 1951,[125] an estimate which would prove to be quite accurate.

Medium Bombers Destroy the Yalu Bridges: Far away to the north on the lines of supply that were going to have to support a Communist ground offensive, the end of March 1951 brought the break-up of Yalu River ice, and FEAF Bomber Command remained responsible for the destruction of the international bridges. With assistance from its Japanese builders, FEAF target experts had calculated the most vulnerable parts of the Sinuiju railway bridge which had given so much trouble in November.[126] Medium bombers were scheduled against Yalu bridge targets on 29 March, only to find them under clouds and to be diverted to an attack against Pyongyang airfield (K–23).[127] That same day, however, three 19th Group B–29's had been scheduled to destroy the Korean terminals of the rail and highway bridges at Sinuiju with the 12,000-pound tarzon bombs which this group's B–29's could carry. Of this small force, one plane returned to base for mechanical reasons, a second carrying the group commander, Col. Paul Jennings, was lost at sea, but the third continued to Sinuiju, and finding clearing weather, launched its controlled bomb, only to have it miss. Escorting F–80's held off most of the MIG's, and the six enemy jets which made passes against the sole B–29 to reach the target did no damage.[128]

Adverse weather, both over the targets and at the home bases, continued to plague the bombing effort. At Yokota the 98th Bombardment Group took off for Yalu missions at night with ceilings as low as 400 feet and quarter-mile visibility, conditions which placed a considerable strain on the replacement crews who were just beginning to develop their skill.[129] The necessity of using new replacement crews in these priority attacks also reduced the effectiveness of the bombing: the 98th Wing attributed disappointing results achieved by its 10-plane attack against the highway bridge at Linchiang on 31 March to its newly assigned

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crews.[130] Bomber Command nevertheless managed three highly effective attacks against the international bridges. On 30 March, 38 B–29's dropped two spans of the Chongsonjin highway bridge, covered the pontoon bridge at Chongsonjin with 1,000-pound bombs, and knocked out spans of the Manpojin railway bridge.[131] Thirty-five B–29's on 7 April left the by-pass bridge at Cho-ri, the railway bridge at Sinuiju, and the highway bridge at Uiju badly damaged and probably unserviceable, although no spans were reported cut.[132] After post-strike reconnaissance FEAF assigned the Sinuiju railway bridge first priority target status, and on 12 April, Bomber Command made a 39-aircraft attack against it with 2,000-pound bombs. Although the patterns were good, and numerous direct hits were noted, the bridge remained standing.[133]

With the notable exception of the Sinuiju railway bridge which stubbornly refused to fall, the Superfortress attacks against the Yalu had severed most of the key bridges connecting the Communist armies with their logistics base in Manchuria. But in terms of damage inflicted upon the bomber force by enemy action, the Yalu bridge attacks were costly. On 30 March all organizations reported enemy flak, and the 19th Group had one bomber make an emergency landing at Itazuke because of wounded crew members.[134] MIG fighters, which intercepted each mission, destroyed a 307th Wing B–29 on 7 April and another on 12 April, and on the latter date shot down or caused the loss of two 19th Group B–29's. Seven other B–29's were damaged on 12 April.[135] In the furious action on 12 April, Superfortress gunners were credited with 10 MIG's destroyed, 4 probably destroyed, and 1 damaged;[136] but despite this defense effort the bombers would have experienced even heavier losses had they not had F–86 and F–84 cover and escort.

On the 30 March mission 4th Wing F–86's provided top cover while 8th Wing F–80C fighters attempted escort; although the MIG's were not especially aggressive, preferring to make a single pass against the bombers and then break away, the F–80C's were clearly unsuited to their mission: at 25,000 feet the MIG's were reported at least 100 miles per hour faster than the old F–80C's.[137] The 27th Fighter-Escort Wing was somewhat insistent that it be given the escort duty, and, with some misgivings about the distance from Itazuke to the Yalu and the shortage of F–84E pylon tanks, General Partridge set them up for escort on 7 April. This wing had to demonstrate exceptional flight discipline to launch 49 F–84's within 15 minutes in an early morning instrument take-off with a 400-foot ceiling and less than a mile visibility, but the Thunderjets made the 560 miles to the Yalu and performed well, maintaining escort to the target and for 50 minutes of the withdrawal. Of the 30 to 40 MIG's which attempted interception, only one managed to break through the 73 F–86's and F–84's which were covering and escorting the bombers; while it destroyed one B–29, the damages might have been much greater, and Brig. Gen. J. E. Briggs, commanding FEAF Bomber Command, called the fighter protection "well nigh perfect."[138] Although their identification of hostile aircraft was somewhat complicated by the fact that the swept-wing Sabres were in the same area, 27th Wing F–84E pilots destroyed one MIG and damaged two others.[139] On 12 April the Sabres and Thunderjets provided 119 escort sorties and were credited with 24 MIG's destroyed or damaged, but the enemy attacked aggressively and swamped the friendly fighters with superior numbers, hitting the bomber force twice with MIG's estimated to number as high as 100 aircraft. Particularly hard hit was the 19th Group's box of 8 B–29's and its escort of 14 F–84's, which fought a 20-minute running battle with some 40 MIG's. For the first time the enemy fighters pressed the attack against an escorted bomber force long before it reached the target area; they appeared to disregard the escorting fighters and to concentrate on attacking the bombers at all costs.[140] The bitterness of the Communist fighter defense attested the seriousness with which the enemy viewed the destruction of their Sinuiju bridges.

Neutralization of Communist Airfields: Although its Bomber Command had not completely destroyed the key Sinuiju railway

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on 12 March, a 36th Fighter-Bomber Squadron flight witnessed a mid-air collision between two MIG's, both of which exploded.[72] Beginning on 22 February 1951, a Sabre detachment of the 4th Wing again entered combat in Korea, and in March the wing operated two squadrons split up between Suwon and Taegu. In order to fly combat air patrols over MIG Alley, the rear squadron had to stage up to Suwon with the result that during March it could manage only 282 combat sorties, the forward squadron during the same period flew 616 combat sorties. The operating facilities at Suwon, moreover, were extremely crude and limited, but the presence of the Sabres in the forward areas at least hampered the activities of the MIG's. Without any really effective opposition during February, the Communist air force had been growing bolder, and on eight occasions during March enemy night raiders dropped bombs against UN front lines near Seoul, inflicting eight casualties in one such attack.[73]

Interdiction Missions: The Red air strength also cramped UN air interdiction plans. In order to conserve the extravagant fighter effort necessary to escort B–29's into the area of enemy fighter opposition, FEAF directed Fifth Air Force on 5 February to undertake the necessary interdiction strikes in northwest Korea,[74] and at CINCFE direction the B–29's were put to work in interdiction strikes in north-central and northeastern Korea. This attempted solution by no means enabled the B–29's to escape the MIG's; on 25 February eight MIG's unsuccessfully attacked a flight of four unescorted B–29's bombing a marshalling yard at Sunchon, losing one of their number to B–29 gunners.[75] Moreover, Fifth Air Force fighter-bombers in the existing situation lacked the ordnance carrying capability to knock out major bridges, and on 26 February that air force requested to be relieved of the interdiction mission in northwest Korea, a proposition agreeable to FEAF, which returned the task to the B–29's effective on 1 March.[76]

On 1 March, 18 B–29's with F–80 escort were scheduled for attacks against rail bridges in the MIG-defended area; running late for rendezvous, however, the medium bombers could be covered by fighters for only a short time, and just after bombs were dropped at Kogunyong, the formation was attacked by 9 MIG's. In a 23-minute fight, 1 MIG was shot down and 2 were damaged, but 2 B–29's were also damaged.[77] The next attack into this area was not until 23 March, when 22 B–29's of the 19th and 307th Groups took out the railway bridges at Kogunyong and Chongju; although the weather was clear and visibility unlimited, no MIG's were met.[78]

Other than in MIG Alley, interdiction missions were fairly easily managed. Most medium bomber sorties were sent against railway bridges, marshalling yards, and supply centers, with some missions directed against airfields. Ordinarily, the 98th Wing furnished 24 B–29's one day, and the 19th Group and 307th Wing furnished 12 B–29's in the two succeeding days. Most bridge attacks were made by four-aircraft flights, approaching their targets at an inside acute angle of from 28° to 37° in order to concentrate more bombs against long narrow objectives. Marshalling yards, also usually long and narrow, presented perfect targets for four-ship formations, if raked along the length.[79] Marshalling yards and supply areas were commonly mined with delayed-action demolition bombs, variable fuzing ranging from 1 to 144 hours. Although tarzon bombs were available in such short supply that FEAF chose to select the targets for this type of ordnance, a number achieved good results, such as the single radar-controlled six-ton tarzon missile which on 11 February took out two spans of the important Kanggye highway bridge.[80] Combat-crew rotation which temporarily lowered operational effectiveness, a continued inaccuracy of weather forecasts, and insufficient target intelligence lowered the efficiency of the bridge-destruction effort, but results remained satisfactory. On 1 February, for example, four-ship flights of the 307th Bombardment Group cut multiple spans out of the key railway bridges at Churongjang, Hongwon, and Tanchon, meriting General Stratemeyer's warm congratulations for the bombing accuracy.[81]

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In addition to attacks against troop concentrations, housing, and supplies, the 452d Bombardment Group utilized a portion of its B–26 light bomber sorties against bridges and communications targets. During February most of these light bomber interdiction sorties were at low level, employing 500-pound and 1,000-pound parademolition bombs or conventional general-purpose bombs with delayed fuzing. During March, however, increased amounts of enemy antiaircraft fire forced the B–26's up to medium-altitude bombing.[82]

Lucrative Armed Reconnaissance: During February and March 1951 the ground fighting kept the Communists sufficiently stirred up so that they moved reinforcements and supplies toward the battle line with less than their usual caution, so that Fifth Air Force was afforded excellent targets for armed reconnaissance. Noting heavy troop movements in northeastern Korea, FEAF directed a concentration of air attacks against the coastal routes for the several days following 7 February,[83] and on 13 February the Fifth Air Force destroyed or damaged a record one-day total of 318 enemy vehicles.[84] On 14 February the Fifth Air Force suggested and FEAF approved a new procedure for armed reconnaissance: specific sorties and areas for continuous surveillance were assigned each fighter wing, the idea being that the pilots would become intimately familiar with a single zone and readily identify camouflaged objectives The Mustang groups, which subdivided their areas to squadrons and then to flights, hailed the policy as a change long overdue.[85] Adopting this system and also emphasizing pilot-meeting evaluations of enemy camouflage tactics, the 18th Wing employed two-aircraft flights on armed reconnaissance, each flight being relieved by another after an hour in the target area. One aircraft flew at 100- to 350-foot altitude, depending on terrain, while the second aircraft remained at 500- to 1,000-foot altitude to provide top cover. The carrying of napalm on armed reconnaissance having proved a wasteful practice during January (pilots were reluctant to retain the incendiary when flying close to the ground and usually expended their tanks on the first likely target), the 18th Group's Mustangs utilized their machine guns as their primary antivehicle weapon.[86]

That the new system of intensive armed reconnaissance held substantial profits was indicated by a mounting total of enemy vehicles reported by Fifth Air Force as destroyed: with fewer interdiction sorties (the FEAF interdiction sortie totals were 9,181 for January, 7,184 for February, and 7,637 for March), Fifth Air Force pilots claimed destruction of 599 enemy vehicles in January, 1,366 in February, and 2,261 in March.[87] Most of these vehicles were apparently destroyed by night intruder B–26's and F–51 fighters, which possessed the staying power to let them remain over communications routes for extended periods, but the 49th Fighter-Bomber Group F–80's, which destroyed 40 enemy vehicles on 13 February, proved that they could also "bird-dog" enemy transport.[88]

Increasing enemy emphasis upon protective measures indicated that he was receiving unacceptable damages. Initially the Communists depended upon camouflage, parking their vehicles beside, between, or sometimes inside of houses in small villages, covering them with straw or a white tarpaulin if the ground was snow covered;[89] but at the end of March few vehicles were still attempting to escape destruction through camouflage. Instead, the enemy was building up his flak defenses, constructing difficult-to-attack log bunkers in almost inaccessible ravines where vehicles could be sheltered during daylight hours, and cramming all available tunnels with vehicles and supplies. The Communists now appeared to be convoying their vehicles from heavily flak-protected areas to the bunkers in one night, to the front lines and return to the bunker zone the next night, and back to safety on the third night. In an effort to penetrate the new defense, Mustangs made predawn and late afternoon take-offs, thus attacking when the enemy was taking or emerging from cover; other fighters attempted to seal tunnels by skip bombing 500-pound GP's into the entrances; still other Mustangs experimented in search of the best ordnance to be used against the log bunkers.[90]

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By continuously attriting the enemy's transport forces and by compelling the Communists to move at night under tortuous road and rail conditions, the UN air forces were obviously denying the Reds a large portion of the logistics which they required. That the attacks against enemy communications routes was hindering the build-up of troops and supplies for any major Communist ground offensive was further attested by a captured political report of the Chinese 35th Division. This division crossed the Yalu on 21 March and experienced a hectic 19-day march to the front: on account of frequent air attacks many soldiers were worn out digging shelters; air raids caused consternation and casualties and increased an already serious straggling problem. Frequently the troops were unable to obtain food for two or three days, the whole result being that when this division reached the front lines it was already suffering from combat fatigue [91]

COORDINATED AIR-GROUND OPERATIONS AGAINST THE COMMUNISTS

The Pattern of Air-Ground Attack: With counter air operations neutralizing the enemy threat from the air and air interdiction operations weakening the enemy situation on the surface, conditions in Korea at the end of January 1951 were propitious for UN air-ground attack. Despite an emphasis upon interdiction and armed reconnaissance—which both assisted the ground attack and deprived the Communists of the logistics needed to support their defense—the Fifth Air Force worked in close coordination with Eighth Army: FEAF aircraft flew 3,255 close-support sorties in February and 5,901 in March, the latter total being theretofore exceeded only in August and September 1950.[92] At the same time that air action paralyzed the mobility of the Communist armies, air-delivered and airdropped supplies permitted Eighth Army units great freedom of maneuver.

At General Ridgway's order, the U.S. I and IX Corps on 25 January initiated operation THUNDERBOLT, designed as a reconnaissance in force which, if enemy resistance proved weak, would also clear the area south of the Han River. Within a day the 25th Division had reached Suwon, and on 30 January the C–46's of the 61st Troop Carrier Group were the first to land at the recaptured Suwon airfield, transporting some 270 tons of vital army supplies there during the first day of operations.[93] At the end of January the U.S. X Corps and ROK III Corps instituted operation ROUNDUP which drove northward against the rejuvenated NKPA II and V Corps, now holding the enemy lines in the central Korean mountains. Successes of the X Corps against stiff resistance permitted further advances in western Korea as the danger of a Communist flanking attack was mitigated; the U.S. 25th Division resumed its offensive on 10 February, reoccupying Kimpo and Inchon during the day without appreciable enemy opposition.[94] A month before, these facilities had been thoroughly demolished at the UN withdrawal, and repairing the Seoul area airfields and the port of Inchon would require many weeks.

The Communists were evidently suffering from a shortage of logistics and the Eighth Army ground operations had thrown them off their balance, for when on the night of 11/12 February they launched their fourth-phase offensive, it was evidently premature.[95] The Reds nevertheless unleashed a violent attack against X Corps along the Hoengsong-Wonju axis and in the Chipyong area, where for three days surrounded elements of the U.S. 2d Division resisted fiercely until relieved by an armored column. The surrounded units—the U.S. 23d Infantry and the French battalion—received 87 C–119 loads of airdropped ammunition, gasoline, and rations in the three days 14 through 16 February.[96] The sharp fighting around Chipyong also demanded strong air support from Fifth Air Force fighter-bombers: Maj. Gen. Clark L. Ruffner, commander of the 2d Division, later wrote General Stratemeyer that after one

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napalm attack against the reverse slope of the final hill leading into the perimeter he had seen more enemy dead than he had ever witnessed before.[97] Heavy fighting also took place north of Chechon, east of Wonju, and south of Chongson, but by 24 February the X Corps was driving the enemy northward.[98] This Communist offensive failed to dislodge the I and IX Corps from their gains along the Han River. After the February Communist offensive was repulsed General Almond expressed the appreciation of X Corps for the continuous and effective air support rendered by Fifth Air Force: "Nothing is more heartening to the front-line soldier," he stated, "than to observe such striking power as was displayed in the X Corps area." [99] General MacArthur also thought of the value of the air-interdicted Red supply lines: "The enemy," he observed, "is finding it an entirely different problem fighting 350 miles from his base than when he had sanctuary in his immediate rear." [100]

On 21 February General Ridgway effected operation KILLER, an attack designed to destroy hostile forces east of the Han River, with the main efforts along the Wonju-Hoengsong and Yongwol-Pyongchang axes. Spearheaded by the rejuvenated 1st Marine Division, the central Korean assault registered steady initial gains, but early spring rains and thawing severed rail and highway communications leading into the IX and X Corps areas, jeopardized further progress.[101] The 314th Troop Carrier Wing was therefore heavily committed to the support of troops north of Wonju; between 23 and 28 February, this wing dropped 1,358 tons in 265 C–119 loads in the area. On 24 February a record for drop tonnage was set when 67 C–119's dropped 329.1 tons to the 1st Cavalry Division at Koksu-ri and to the 1st Marine Division at Wonju and two C–46's dropped four tons of rations to the 2d Division at Puphong-ni.[102]

Instead of trying a costly frontal attack against Seoul, Ridgway on 7 March instituted operation RIPPER, which placed the main avenue of attack along the axis Hongchon-Chunchon. Elements of the 25th Division crossed the Han near its confluence with the Pukhan River on the first day of the offensive, and in three days of savage fighting the enemy was driven northward in disorder. Simultaneously, the 1st Cavalry and 1st Marine Divisions aimed a double envelopment at Hongchon, and on 12 March enemy resistance suddenly began to crumble. Hongchon fell on 15 March, and on the night of 14/15 March the Chinese, evidently fearing an Eighth Army flanking attack, abandoned Seoul without a fight.[103] By 18 March the Reds were attempting to withdraw their forces on all fronts. When the Communists panicked, close air support strikes took heavy casualties: in mid-March four F–84's and eight F–80's worked over an estimated 1,200 enemy troops spotted for them by a Mosquito controller, and when the UN ground troops took the position they found 600 dead and 300 wounded.[104] Observed General MacArthur on 24 March: "It is increasingly evident that the heavy destruction of the enemy's lines of supply, caused by our round-the-clock air and naval bombardment, left his troops in forward areas deficient in requirements." [105]

The Airborne Attack at Munsan-ni: In the expectation of exploiting an enemy retreat Generals Partridge and Ridgway had been planning an airborne employment of the 187th Airborne Regimental Combat Team. On 21 March Ridgway and Partridge alerted their forces for TOMAHAWK: the 187th RCT was to be dropped at Munsan-ni, a village lying athwart the Seoul-Kaesong road, to trap Communist troops being pursued northward out of the Seoul area by the U.S. I Corps.[106]

In preparation for an earlier paradrop at Chunchon which had been canceled the 315th Air Division (Combat Cargo) had concentrated 75 C–119's of the 314th Troop Carrier Wing and 55 C–46's of the 437th Troop Carrier Wing at Taegu (K–2) on 21 March; here also was located the 187th RCT which had been withdrawn from the Eighth Army line early in March for refresher airborne training. Serials had been loaded for the Chunchon drop, but because of the severe dust at Taegu no preflight run-ups of the transport

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engines were possible after the aircraft had been parked on their dispersals. At approximately 1200 hours on 21 March, Brig. Gen. John P. Henebry, commanding the 315th Air Division, received planning information that the 187th would be airdropped at Munsan-ni on the morning of 23 March. General Henebry and his two wing commanders, accompanied by Brig. Gen. Frank S. Bowen, commander of the 187th RCT, made a late afternoon visual reconnaissance of the objective area, and at 1730 hours they met with Generals Partridge and Ridgway to confirm D-day as 23 March and to set H-hour at 0900 hours. Recognizing the impossibility of any considerable changes at such a late date, Henebry and Bowen drew their plans so as to utilize the serials and loadings already set up for the canceled Chunchon operation.[107] Since as many as 12,000 North Korean troops were thought to be in the Munsan-ni area, emphasis was placed upon the necessity of getting the 187th RCT on the ground in two drop zones as speedily as possible.[108]

Weather on the morning of 23 March was perfect for the operation, and for 30 minutes before jump time the Fifth Air Force used 56 B–26's of the 3d and 452d Bombardment Wings to soften up the objective areas with 500-pound air-burst bombs and "ramrod" low-level strafing and rocketing attacks.[109] Sixteen F–51's flew escort for the transports, and other fighters under direction of a Mosquito airborne controller gave support during the day. General Ridgway said it was the best fighter support he had seen on any airdrop.[110]

At Taegu dust made transport take-offs hazardous, but pilots maintained ten-second intervals and no one got into trouble. Over the drop zones during the day, five serials of transports launched their paratroopers and dropped their equipment without difficulty. Only one of the six serials went astray after its lead plane aborted, the mishap taking place as follows: shortly after take-off the lead C–46 in the second serial had mechanical difficulty (the only plane of 119 participating to abort) and had to turn back to the alternate airfield at Taegu South (K–37). The deputy leader took over, but when his heavily loaded C–46's were unable to keep up with the proper timing, he elected to skip the IP and head directly to the south drop zone. Due to error in low-level navigation, however, the leader missed his assigned zone and dropped a battalion of paratroopers into the north drop zone. In the meantime, the regular serial commander at K–37 secured a spare C–46 and, at the insistence of the battalion commander who was on his plane, proceeded to the south drop zone where he dropped the battalion commander and staff. Had the enemy opposition been up to the caliber expected, the 30 men dropped on the south zone would doubtless have been casualties, but, as it was, General Bowen was informed of the situation and promptly sent a company down to retrieve them.[111]

Other than the misplaced battalion, the airborne operation went satisfactorily: 72 C–119's dropped 2,011 paratroopers and 204 tons of supplies and equipment, while 48 C–46's unloaded 1,436 paratroopers and 15.5 tons of ammunition, food, and signal equipment. During and immediately after the jump the 187th RCT suffered 84 jump casualties, 18 wounded, and 1 man killed by enemy action. Forty of the jump casualties were soon returned to action. During the operation five C–119's incurred minor damage from enemy small-arms fire, and one C–119, evidently because of enemy fire, broke into flames and crashed en route home, killing the pilot and copilot.[112] While the 187th RCT soon linked up with a tank battalion from Seoul, it remained so isolated from ground supply that air resupply drops on D plus 1, D plus 3, and D plus 4 were essential to immediately ensuing military operations. On 24 March, 36 C–119's dropped 40 personnel and 187.7 tons of supplies at Munsan-ni; on 26 March, 10 tons were dropped by 4 C–46's, and on 27 March, 65.8 tons by 12 C–119's. The last two days' drops were of vital importance, because the paratroopers, in a post-drop change of plans, had entered an area inaccessible to road supply; many of the men had received

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only a single meal in 36 hours, and one battery was down to 5 rounds of ammunition.[113]

A joint critique held on 3 April by the staffs of the 187th RCT and the 315th Air Division noted lessons which were to be drawn from this operation. The failure of the deputy leader of the second serial to drop at the proper zone was attributable only to human error, but General Henebry suggested that when enemy air opposition permitted, an airborne command ship, fully equipped for navigation and multiple-channel radio communication, should function as the drop-zone control ship during a paratroop operation. Henebry also recommended that a joint briefing of airborne unit commanders and serial leaders and deputies was necessary in order to give each a clear understanding of the other's specific tasks and problems. Because airborne troops were responsible for packing, loading, and ejection of cargo, General Bowen assumed responsibility for such malfunctions as had occurred in the heavy equipment drops; Bowen, however, stated that there was less damage than during the Sunchon-Sukchon drop and that much of this damage resulted from the use of parachutes recovered from the preceding airborne operation. As for aerial resupply, once paratroops had landed, Bowen believed that Rebecca-Eureka radio beacons would simplify the sometimes complex identification of drop zones General Henebry recommended that a minimum of 24 hours be allowed for any change in the drop zone after the aircraft had been marshaled and that a minimum of 5 days' notice be given for alert, preliminary planning, and aircraft stand-down prior to laying on an airborne operation.[114]

While the airborne operation at Munsan-ni was a technical success, its tactical results in terms of enemy troops captured or destroyed were negligible. Enemy casualties following the airborne assault were estimated at 150 to 200 killed in action and 87 taken prisoner. Other operations incident to the establishment of perimeter defenses netted an additional 24 prisoners.[115] The area around Munsan-ni was held by a single regiment of the NKPA 19th Division, a second-rate combat unit. Prisoners captured by the UN paratroopers stated that as early as 21 March their regiment had received warnings from higher Communist levels that the 187th RCT would be dropped against Munsan-ni on 23 March; evacuation of the regiment had been ordered, but for some unknown reason had not been obeyed.[116] This statement, however, must have been in error since it implied that the Communists were exactly cognizant of UN intentions; what probably had happened was that the concentration of troop carriers at Taegu had been noted by Communist agents and a general alarm had been sent out to all forward Communist units that a paratroop drop was in the offing.

Initiation of MPQ–2 TADPOLE Operations: Ever impressed with the necessity of increasing the night air capability of his command and understanding the need of ground troops for close air support under conditions of night and all-weather, General Stratemeyer had announced that FEAF must find the control techniques necessary to such tasks. During January in Korea AN/UPN–4 ground-radar marking beacons were tested, but, while they provided the desired front-line demarcation for night close air support, the Fifth Air Force thought them generally troublesome and suggested the use of MPQ–2 radar.[117] The MPQ–2 was an improved model of the old SCR–588 gun-laying radar which had been used for blind-bombing control during the latter stages of the European campaigns of World War II,[118] and during the years following it had been developed for radar bomb-scoring purposes.* Three detachments of the SAC's 3903d Radar Bomb Scoring Squadron had been moved to Pusan in September 1950,[119] but they had been infrequently utilized in combat.

At the end of February 1951, tests suggested by General Partridge indicated that the MPQ–2 radars could satisfactorily control B–26 and B–29 aircraft in front-line night bombing attacks,[120] and beginning on 6 March, Bomber Command committed one or more of its B–29's to these MPQ–2 missions. Having

*See Chap VII, pp 196-99 for a description of the TADPOLE control technique

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been designed to accompany the motor marches of antiaircraft artillery, the MPQ–2 radars possessed some degree of ground mobility and they were able to assume positions near the three U.S. corps headquarters; by the end of March one MPQ–2 detachment was north of the Han River with I Corps, and this corps was highly enthusiastic regarding this night bombing support, forwarding POW reports that such attacks caught enemy troops by surprise out of their fox-holes moving around.[121] Despite their theoretical mobility the other two MPQ–2 detachments were experiencing difficulties in finding suitable operational sites in the rugged terrain of central and eastern Korea.[122]

THE COMMUNIST SPRING OFFENSIVE

Intimations of Impending Communist All-Out Attack: Although enemy resistance stiffened as Eighth Army forces neared the 38th parallel, the ground fighting progressed satisfactorily so that by the end of March 1951 the main line of resistance ran generally from Munsan east through Chunchon to the vicinity of Hyon-ni, then northeast to Yangyang, which fell to ROK troops on 27 March.[123] In a few days more than two months, the UN coordinated air and ground action had driven Communist forces back to the 38th parallel UNC intelligence had received reports that the Chinese intended to defend the 38th parallel at all costs until May 1951, at which time (or earlier if their positions were jeopardized) they were going to launch an all-out spring offensive.[124]

In terms of climatic factors and the stiffening enemy resistance, the reports of an impending Communist spring offensive made sense. Inclement spring weather would favor the unmechanized, "on-foot" Communist armies, whereas atmospheric conditions—most suitable for aerial operations in winter—would become less favorable with the arrival of spring and summer rains and cloud cover. Without any precise information at hand, the Eighth Army expected the Communists to launch their fifth-phase offensive at any time between 20 April and 1 May 1951,[125] an estimate which would prove to be quite accurate.

Medium Bombers Destroy the Yalu Bridges: Far away to the north on the lines of supply that were going to have to support a Communist ground offensive, the end of March 1951 brought the break-up of Yalu River ice, and FEAF Bomber Command remained responsible for the destruction of the international bridges. With assistance from its Japanese builders, FEAF target experts had calculated the most vulnerable parts of the Sinuiju railway bridge which had given so much trouble in November.[126] Medium bombers were scheduled against Yalu bridge targets on 29 March, only to find them under clouds and to be diverted to an attack against Pyongyang airfield (K–23).[127] That same day, however, three 19th Group B–29's had been scheduled to destroy the Korean terminals of the rail and highway bridges at Sinuiju with the 12,000-pound tarzon bombs which this group's B–29's could carry. Of this small force, one plane returned to base for mechanical reasons, a second carrying the group commander, Col. Paul Jennings, was lost at sea, but the third continued to Sinuiju, and finding clearing weather, launched its controlled bomb, only to have it miss. Escorting F–80's held off most of the MIG's, and the six enemy jets which made passes against the sole B–29 to reach the target did no damage.[128]

Adverse weather, both over the targets and at the home bases, continued to plague the bombing effort. At Yokota the 98th Bombardment Group took off for Yalu missions at night with ceilings as low as 400 feet and quarter-mile visibility, conditions which placed a considerable strain on the replacement crews who were just beginning to develop their skill.[129] The necessity of using new replacement crews in these priority attacks also reduced the effectiveness of the bombing: the 98th Wing attributed disappointing results achieved by its 10-plane attack against the highway bridge at Linchiang on 31 March to its newly assigned

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crews.[130] Bomber Command nevertheless managed three highly effective attacks against the international bridges. On 30 March, 38 B–29's dropped two spans of the Chongsonjin highway bridge, covered the pontoon bridge at Chongsonjin with 1,000-pound bombs, and knocked out spans of the Manpojin railway bridge.[131] Thirty-five B–29's on 7 April left the by-pass bridge at Cho-ri, the railway bridge at Sinuiju, and the highway bridge at Uiju badly damaged and probably unserviceable, although no spans were reported cut.[132] After post-strike reconnaissance FEAF assigned the Sinuiju railway bridge first priority target status, and on 12 April, Bomber Command made a 39-aircraft attack against it with 2,000-pound bombs. Although the patterns were good, and numerous direct hits were noted, the bridge remained standing.[133]

With the notable exception of the Sinuiju railway bridge which stubbornly refused to fall, the Superfortress attacks against the Yalu had severed most of the key bridges connecting the Communist armies with their logistics base in Manchuria. But in terms of damage inflicted upon the bomber force by enemy action, the Yalu bridge attacks were costly. On 30 March all organizations reported enemy flak, and the 19th Group had one bomber make an emergency landing at Itazuke because of wounded crew members.[134] MIG fighters, which intercepted each mission, destroyed a 307th Wing B–29 on 7 April and another on 12 April, and on the latter date shot down or caused the loss of two 19th Group B–29's. Seven other B–29's were damaged on 12 April.[135] In the furious action on 12 April, Superfortress gunners were credited with 10 MIG's destroyed, 4 probably destroyed, and 1 damaged; [136] but despite this defense effort the bombers would have experienced even heavier losses had they not had F–86 and F–84 cover and escort.

On the 30 March mission 4th Wing F–86's provided top cover while 8th Wing F–80C fighters attempted escort; although the MIG's were not especially aggressive, preferring to make a single pass against the bombers and then break away, the F–80C's were clearly unsuited to their mission: at 25,000 feet the MIG's were reported at least 100 miles per hour faster than the old F–80C's.[137] The 27th Fighter-Escort Wing was somewhat insistent that it be given the escort duty, and, with some misgivings about the distance from Itazuke to the Yalu and the shortage of F–84E pylon tanks, General Partridge set them up for escort on 7 April. This wing had to demonstrate exceptional flight discipline to launch 49 F–84's within 15 minutes in an early morning instrument take-off with a 400-foot ceiling and less than a mile visibility, but the Thunderjets made the 560 miles to the Yalu and performed well, maintaining escort to the target and for 50 minutes of the withdrawal. Of the 30 to 40 MIG's which attempted interception, only one managed to break through the 73 F–86's and F–84's which were covering and escorting the bombers; while it destroyed one B–29, the damages might have been much greater, and Brig. Gen. J. E. Briggs, commanding FEAF Bomber Command, called the fighter protection "well nigh perfect." [138] Although their identification of hostile aircraft was somewhat complicated by the fact that the swept-wing Sabres were in the same area, 27th Wing F–84E pilots destroyed one MIG and damaged two others.[139] On 12 April the Sabres and Thunderjets provided 119 escort sorties and were credited with 24 MIG's destroyed or damaged, but the enemy attacked aggressively and swamped the friendly fighters with superior numbers, hitting the bomber force twice with MIG's estimated to number as high as 100 aircraft. Particularly hard hit was the 19th Group's box of 8 B–29's and its escort of 14 F–84's, which fought a 20-minute running battle with some 40 MIG's. For the first time the enemy fighters pressed the attack against an escorted bomber force long before it reached the target area; they appeared to disregard the escorting fighters and to concentrate on attacking the bombers at all costs.[140] The bitterness of the Communist fighter defense attested the seriousness with which the enemy viewed the destruction of their Sinuiju bridges.

Neutralization of Communist Airfields: Although its Bomber Command had not completely destroyed the key Sinuiju railway

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bridge, FEAF had to shift the medium bomber effort to a more ominous target system on 13 April. According to a Chinese officer captured by the IX Corps in February, regimental staff officers had recently returned from a special training conference in Mukden, where they had been given instructions in air-ground liaison procedures together with necessary panels for marking their front lines.[141] Taken by themselves such reports might mean nothing more than that the Communists were attempting to buck up the morale of their ground soldiers, who had keenly missed friendly air so far in the Korean fighting, but during March the Communists began repair and development at some 10 of their North Korean airfields. Taken in conjunction with reported augmentations of Red air strength, this rehabilitation of airfields presaged a Communist intent to launch an air attack in coordination with their impending spring ground offensive.[142] General Partridge felt that the danger of enemy air attack was grave enough to warrant all passive defense measures which would not interfere too greatly with sustained combat operations.[143]

According to a FEAF-approved Bomber Command policy airfield attacks were not made until reconnaissance showed that Communist repairs were just about to make the field operational, but after 13 April the medium bombers began a priority neutralization of air facilities in North Korea. Scheduling an average of 12 planes daily for the work, Bomber Command cratered the runways and strewed a liberal proportion of delayed action high explosives over the airfields at Anak, Sinmak, Sunan, Sariwon, Yongju, Hamhung, Yonpo, Kangdong, and Onjong-ni Pyongyang's two airfields were hard hit by the medium bombers on 16 and 19 April, the main airfield receiving 178.35 tons of bombs and the second field 90 tons. This activity on the part of the medium bombers continued in main emphasis until the end of April, at which time a portion of the B–29 effort returned to interdiction targets.[144]

Early in May reconnaissance noted that the Communists were keeping slightly over 40 single-engine fighter type aircraft in revetments at Sinuiju airfield, just across the Yalu from the Antung complex. Rather than to permit this hazard to endure, General Partridge sent over 300 Fifth Air Force, Navy, and Marine fighters against Sinuiju airfield on 9 May to destroy or damage 38 revetted Communist planes and 106 buildings, and to inflict large personnel casualties upon demoralized Red airmen.[145]

This neutralization of Red North Korean airfields and the destruction of aircraft which the Communists attempted to bring forward meant that UN air superiority would be maintained throughout the Communist spring ground offensives. That FEAF had not been stalking a bogey when it laid on these air superiority operations later became obvious when a report of a special aviation inspection group of the Red Chinese general staff came to hand in the fall of 1951: this report bitterly deplored its lack of success in rehabilitating North Korean airfields and asserted: "If we had had a strong air support we could have driven the enemy into the sea." [146]

Communist Attack and Eighth Army Counterattack: Early in April the Eighth Army, commanded after 11 April 1951 by Lt. Gen. James A. Van Fleet,* continued to press northward toward the objectives contemplated in operations RUGGED and DAUNTLESS. But as the Eighth Army moved forward toward the enemy assembly and supply area bounded by Chorwon-Kumhwa-Pyongyang, commonly known as the "Iron Triangle," a realistic attitude toward the capabilities of the enemy forces prompted General Van Fleet to make plans to resist an enemy attack. planners therefore defined a series of lines to which UN troops would execute coordinated withdrawals, maintaining contact with the enemy at all times, and inflicting maximum losses on him by utilizing superior ground and air firepower. When the Communist offensive had run its course, the Eighth Army would counterattack.[147]

Eighth Army anticipated that the Communist attack would come at some time between

*See Chap. III, p 71

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20 April and 1 May, and this proved an accurate estimate, for at 2000 hours on 22 April the enemy launched the "first impulse" of his vaunted fifth-phase offensive The heaviest attacks, prosecuted by an estimated 337,000 Chinese troops, fell upon the U.S. I and IX Corps, obviously with the purpose of capturing Seoul and cutting the transpeninsular Seoul-Kansong highway. Enemy pressure forced the UN forces backward with only one untoward incident: hit hard by Chinese troops south of Kumhwa the ROK 6th Division was routed and disorganized, this action opened a gaping hole between the U.S. 24th and 1st Marine Divisions in the IX Corps line. In a demonstration of the flexibility of air power, the Joint Operations Center threw daylight fighter-bomber effort into the breach and employed MPQ–2 directed medium bomber attacks there at night. By 26 April the IX Corps had cleared up its difficulties and had launched local counterattacks to open the Seoul-Kansong highway. On the I Corps front the ground troops were supported by fighter-bombers under control of Mosquito airborne controllers and TACP's and also by night-bombing B–26 and B–29 aircraft under MPQ–2 radar control. Although gradually forced back to a line about three miles north of Seoul, the I Corps there maintained its defenses: recording that air power and artillery "kept enemy activity near the friendly front lines to a minimum during daylight hours . . . and made it possible for the friendly forces . . . to move at will during daylight, and prepare for the inevitable enemy assaults at night." In numerous instances the B–26's, after dropping their bomb loads, strafed enemy artillery positions, revealed by muzzle-flash in the darkness.[148] By Communist reckoning, the "first impulse" of their fifth-phase offensive had run its course on 29 April.[149]

By 1 May the Eighth Army's western flank had been pushed back to its final defensive line but the army was intact and air-ground action had inflicted heavy casualties upon the Communists. Air reconnaissance now indicated that the enemy was shifting the bulk of his forces from the west to the Chunchon area for another all-out thrust down the center of the peninsula. To take advantage of these movements and to keep the enemy off balance, UN armored task forces drove out against the enemy. Assisted by a blanket of fog and rain, the Communists launched the "second impulse" of their fifth-phase offensive on the night of 15 May with twin attacks—the heaviest in the Naepyong-Inje-Nodong area of the east-central front, while a second thrust attacked in the Yongyang-Kapyong area of the west-central front in an obvious effort to outflank Seoul. The main Red effort, made with 21 Chinese divisions, fell upon the U.S. X Corps, and ROK forces broke in the vicinity of Hangye, exposing the right flank of the U.S. 2d Infantry Division. This division nevertheless moved over to close the gap, while the 3d Infantry Division raced over from its reserve position southeast of Seoul. Once again tactical air power demonstrated the value of flexibility: between 10 May and 5 June the X Corps drew 2,330 close-support fighter-bomber sorties, and it funneled aircraft to its divisions as rapidly as they could handle them—about 3 to 4 strikes per hour. Massed enemy troops provided excellent targets, and the fighter aircraft reported day after day that their napalm or bombs had burst in the center of enemy groups; on one day, 17 May, the 2d Division reported at least 5,000 enemy troops killed by close support aircraft, and the X Corps estimated that 16,693 enemy troop casualties were inflicted by air on its front during the Red offensive. Night bombing B–26's and B–29's also proved distinctively effective. Although the force of the initial Communist attack drove forward about 30 miles and came within 20 miles of the key communications hub at Wonju, the Reds did not possess an ability to exploit their gains and the "second impulse" ran down on 21 May.[150]

These disastrous Communist offensives set them up for a UN counterattack of major proportions, an opportunity which General Van Fleet was quick to seize on 19 May when he ordered I and IX Corps to move forward on

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the western front. As this UN counteroffensive pressed the enemy, his attempt to withdraw his forces resulted in a virtual rout On 27 May, Van Fleet ordered operation PILEDRIVER, whereby the X Corps and ROK I Corps made limited advances while the I Corps, turning to the north and east of IX Corps, would secure the vital Chorwon-Kumhwa area. By 2 June the pursuit of the Reds, a matter much complicated by soggy, rain-soaked roads, was ending as Communist resistance stiffened, but on 10 June the U.S. I Corps breached the "Iron Triangle." The Eighth Army had now regained all the territory lost to the enemy in his twin-impulse spring offensive, and it had carried into vital enemy assembly areas, over-running large stores of hostile supplies. Dominating the base of the "Iron Triangle," the Eighth Army commanded the enemy's fortified area just north of the 38th parallel; it also controlled the vital road networks just north of the parallel over which the enemy had been sideslipping his divisions from west to east and east to west. Any large-scale cross-peninsula movements of enemy troops would now have to use circuitous northern routes [151]

Air Action against the Communist Offensive: As the Communist aggressors had no doubt hoped, unfavorable flying weather severely hampered UN air activity at the beginning of their spring campaign and again at the end of May. FEAF combat aircraft nevertheless managed a strong attack: between the beginning of the Communist offensive on 22 April and the conclusion of Eighth Army's pursuit of the Red forces on 2 June 1951, FEAF fighters flew 16,130 combat sorties, its light bombers 2,408 sorties, and its medium bombers 589 sorties On 30 April FEAF established a record of 1,277 sorties of all types, 960 of them being mounted by the Fifth Air Force. The full extent of the destruction wrought upon the Communist armies by this air attack cannot be exactly reckoned due to the difficulty of assessing the results of the highly destructive B–26 and B–29 TADPOLE missions,* but the Fifth Air Force alone during April and May 1951 claimed the destruction of 26 enemy aircraft, 387 artillery pieces, 25 bridges, 32 tanks, 54 locomotives, 1,194 railway cars, 3,581 vehicles, and 21,536 enemy personnel.[152] Although for the first time in the Korean operations POW's indicated that they had received more of their casualties from UN artillery than from air action, the air estimates were undoubtedly conservative and out of context with the Far East Command estimate that a total of 168,134 enemy casualties had been inflicted by all arms during the period.[153] Indicative of the conservative air claims was a statement by a veteran fighter pilot on duty with the 1st Cavalry Division as forward air controller: "Our estimates of enemy casualties are on the bashful side. The Army, who should know, generally gives us credit for heavier casualties." [154]

Through a proper exploitation of the flexibility of air power, General Partridge was able to increase the close-support sorties when Eighth Army was under ground attack and to direct planes to armed-reconnaissance and interdiction missions during those intervals when the Communists were regrouping and resupplying their forces. The flexibility of air power also permitted the Joint Operations Center to transfer the main weight of Fifth Air Force attack from the support of the I and IX Corps during the "first impulse" to the support of the X Corps during the "second impulse" of the Chinese Communist offensive. Fifth Air Force pilots demonstrated great versatility in transferring their efforts from armed reconnaissance to close support as the ground situation determined. During the first three weeks of April, for example, the majority of 18th Wing F–51 missions were two-ship flights on armed reconnaissance, seeking and destroying enemy troops, vehicles, and supplies and using 500-pound bombs to post-hole the enemy's waterlogged roads and rail tracks. When the Communists attacked, the 18th Wing immediately switched from two-ship to four-ship flights for close-support missions with ground controllers.[155] From Taegu (K–2) the 49th Wing's F–80's added 265-gallon tip tanks to extend their time for locating

**See* pp 65-66.

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and working over targets with the napalm and 500-pound proximity-fuzed bombs which proved particularly effective against enemy personnel.[156]

At the end of May when the Communists desperately attempted to move their defeated forces northward, Fifth Air Force pilots redoubled their armed-reconnaissance efforts with good results. Thus on 25 May, a flight of four 8th Group F–80's surprised nine trucks, loaded with enemy troops, and a heterogeneous assortment of men and pack animals streaming northward on the road from Hwachon; releasing their napalm at less than 100 feet, the F–80's sent a wall of flaming liquid over the aggregation causing the Communist soldiers "to curl up like shrimps dunked in hot grease." [157] Again on 26 May the Fifth Air Force ordered all wings to dispatch flights to the Inje area where the roads were clogged with enemy personnel and equipment. Because of marginal weather the missions were at the discretion of wing commanders and only the 27th Wing attempted a mission; its 16 F–84's penetrated the weather to slaughter more than 700 enemy troops.[158] With the approaching stabilization of the enemy lines and the disappearance of lucrative road targets toward the end of June, the fighter-bombers turned to missions of road interdiction, following a program earlier laid out in Fifth Air Force intelligence for execution during the rainy months. Flight leaders now sought out critical choke-points along the highways—preferably road-bed fills through low and wet ground—where 500-pound bombs would disrupt the transportation of supplies to the enemy.[159]

The combat effort mustered by Fifth Air Force fighter-bombers was highly creditable, but it was nevertheless hampered not only by the bad flying weather but by the continuing lack of passably adequate airfields in Korea. Fortunately, the Mustangs were able to get into forward bases: having begun to stage its two squadrons of Mustangs through the Seoul airport (K–16) on 8 April, the 35th Wing completed 1,001 sorties during the month, approximately three-fourths of them in close support of ground troops. Benefiting from their somewhat hazardous proximity to the battle line three miles north of Seoul (howitzers, firing at the enemy, encircled the Seoul airfield), the 39th and 40th Squadrons were able to fly more than 400 sorties within a 4-day period late in April.[160] But the heavy sortie rate, poor air facilities, and limited maintenance possible in Korea rapidly ate up the stocks of serviceable F–51's, and by an administrative change undertaken to bolster the air defense forces in Japan, the 35th Fighter-Interceptor Wing was transferred back to Johnson Air Base effective 25 May 1951; preparatory to this change the 18th Fighter-Bomber Wing took over the 39th Squadron and the staging detachment at K–16. After 9 May the augmented 18th Wing staged its Mustangs through the Seoul airport.[161]

During April and half of May the two Japanese-based F–80 wings staged their return flights through the 49th Wing's base at Taegu (K–2), but by 14 May the PSP runways at K–2, never satisfactory because of hurried laying and now being blasted by JATO take-offs, could no longer be considered operational. Coming only a few days before the second assault of the Communist offensive, the situation was indeed grave, but it was met by various expedients. The 49th Wing began combat loading its F–80's at Tsuiki and refueling them for the return flight at K–2.[162] On 18 May the 51st Wing transferred its 16th Squadron to Suwon airfield (K–13) and began staging a part of its 25th Squadron through this none-too-satisfactory facility. The runway was extremely short for combat-loaded F–80's, and inclement weather bogged the parking areas. By original orders the whole 51st Wing would have been in place at Suwon on 15 June, but the relaxation of Communist ground pressure slowed the movement, and it was not until 1 October that the 51st Wing changed its command post from Tsuiki to Suwon.[163] The final closing of K–2 to all but emergency landings on 20 May restricted the 8th Fighter-Bomber Wing's F–80 operations because, for the time being, no other Korean base could accommodate these planes. Fly-

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ing from Itazuke and its sub-base of Fukuoka, 8th Group F–80's could spend no more than 7 to 10 minutes in the target areas in late May The 8th Wing, however, was in the process of rehabilitating Kimpo airfield (K–14), and on 25 June it was able to move the 8th Group there. Formal change of the 8th Wing command post from Itazuke to Kimpo did not come about until 23 August.[164] Once again Fifth Air Force tactical aircraft had to surmount operational difficulties to effect the defeat of a major Communist ground campaign.

Night Air Action against the Communist Invaders: "Enemy front line troops," stated General Stratemeyer on 9 May 1951, "have now learned that darkness no longer provides a protective cloak against our pinpoint air attacks on their positions." [165] New to the Korean war was the strong support rendered by night-flying FEAF aircraft. For the first time the Communist armies, which had long believed it safe to move and fight during the hours of darkness, had no respite from aerial attack. With the beginning of the "Big Red Push" on 23 April, General Partridge called upon the 3d Bombardment Wing to increase its sorties to 48 a night; while this maximum effort had to be cut back at the end of April, night intruder crews continued to stage 2 missions each night out of Taegu airfield (K–2) until 8 June when the PSP runway there began damaging so many of the critically short B–26 tires that the staging operation was no longer logistically possible.[166] On the deck strafing attacks by these 3d Wing night intruders took a toll of 856 Communist vehicles destroyed and 1,817 damaged at a time when the Reds were straining to supply their ground offensives.[167]

At the same time the other light bomber group—the 452d—was held to a heavy schedule of day missions while it also prepared to undertake night intrusion. Using MPQ–2 to bomb through cloud cover in April, the 452d not only gained familiarity with the control technique but rendered close support to Eighth Army ground troops. The 452d Wing moved to Pusan East airfield (K–9) between 12 and 23 May, and, beginning limited night operations on 11 June, it had completely converted to night flying by 20 June.[168] The general employment of the night flying B–26's paralleled that of the fighter-bombers. when the enemy was attacking, the B–26's gave close support to ground troops through MPQ–2 control, and during the periods of enemy regrouping and supply, they sought out the numerous enemy vehicles immediately behind the battle lines with the assistance of C–47 flare-dropping planes.[169]

Experimental in March, the MPQ–2 TADPOLE technique provided a means by which FEAF Bomber Command B–29's tremendously augmented the night attack capability during April and May 1951. During April, Bomber Command flew 58 of these MPQ–2 missions with 557.95 tons of bombs; in May it flew 208 sorties with 2,042 tons of bombs, this effort being more than a third of Bomber Command's total sorties flown during May. From the routine 2 MPQ–2 controlled sorties of early April the effort was increased to 4 nightly sorties at the beginning of the Communist offensive, to 5 on 28 April, to 11 on 18 May, and finally during 19 through 22 May the complete Bomber Command effort (80 sorties) was employed on MPQ–2 controlled missions; after this the number of such sorties was cut back as the ground situation improved. Essentially, the radar-controlled missions were simple· individual B–29's reported in to the MPQ–2 controller every 30 minutes, flew courses, and dropped their bombs as directed by the controller. Flight altitudes were generally 17,000 feet over the target, and solid cloud cover underneath had no effect upon the mission. Ordnance employed was the 500-pound general-purpose bomb with proximity-fuzed nose, delay arming action, and non-delay tail fuzing [170] Although B–26's utilized this same technique with good results, the combination of the B–29's large bomb-carrying capacity, the antipersonnel proximity-fuzed 500-pound bombs, and the precision MPQ–2 control made the B–29 particularly effective. Each B–29, for example, could rain down about 600,000 high velocity bomb frag-

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ments, which by all reports proved deadly to enemy troops caught in the open.[171]

Whether made by light or medium bombers, the MPQ–2 sorties were highly effective, as attested by numerous ground reports. On the night of 26/27 April two B–26's were called in to attack a large group of enemy personnel with 260-pound fragmentation bombs; after daylight, ground patrols counted more than 400 Communist dead.[172] Near Kapyong a ground patrol pushing forward in daylight after a close air support night attack by a single B–29 found 600 dead in the bombed area. ROK forces driven from a hill near Inje called for B–29 support, and after a single strike they retook the hill in the morning, finding 800 Communist dead.[173] The U.S. IX Corps reported that a strike against a large concentration assembling in front of friendly positions "completely stopped preparation for attack and friendly units received no further attack that night at all." [174] After night strikes on 26/27 April, X Corps reported: "Prisoners of war . . . are really complaining about night bombing. We think the night effort we have been receiving has done a great deal to discourage the enemy." [175]

During the second phase of the Chinese Communist offensive against the U.S. X Corps, MPQ–2 controlled night bombing constituted what General Almond called "an epic in our warfare." [176] During the period 16 through 23 May, X Corps was supported nightly by B–26 and B–29 bombers, the number of planes available varying from 2 B–29's and 8 B–26's on the night of 16/17 May to a total of 22 B–29's on the night of 22/23 May. These bombers were used against two major targets, enemy reserves and enemy units assembling from attacks. On several nights General Almond evaluated the MPQ–2 missions as being successful when, after enemy concentrations were bombed, no enemy attack materialized. On the nights of 20 and 21 May, however, B–29 close-support bombing accounted for one enemy regiment and one battalion, a total of 4,000 dead being verified by actual count. General Almond thought it highly significant that the enemy neither brought up reserves nor launched night attacks against the X Corps after 20 May.[177]

Although the night bomber support was generously provided by FEAF and was, according to all reports, highly successful, the bombing system could succeed only when it was provided proper targets by the ground forces. The X Corps utilized information obtained from prisoners, observation posts, artillery air observers, and last-light fighter pilots to mature its night bombing targets, which most desirably were bodies of enemy troops, in fairly dense concentration and under light shielding. That the target selection was not as good as it might have been was pointed out in an Army operational research study made in the field in May and June 1951: this study concluded that 50 per cent of the targets recommended by ground units could be classified as valid, 28 per cent as probable, and the remainder as non-existent targets.[178] Under such circumstances the MPQ–2 controlled night bombardment effort did not attain its maximum effectiveness.

Air Transportation to Korea: As had been the case in earlier enemy offensives, the Communist spring campaign brought demands for increased air transportation. By March and April 1951, however, both Eighth Army and Fifth Air Force were able to make some use of surface carriers: the port of Inchon began receiving water shipments in March and the Korean rail lines were extended north to Seoul During February and March the 315th Air Division (Combat Cargo) was penalized by the physical limitations of Korean airfields, particularly the runways of the so-called "middle K-sites" which were in such poor condition that heavier cargo aircraft could not operate into them.[179] Meanwhile, the 315th Air Division's C–119 aircraft were increasingly in need of general overhaul and reconditioning, but, being the best available plane for air-dropping supplies, they were retained in use until 29 March when two C–119's each had an engine drop off in normal flight, and FEAF on 31 March had no choice but to ground all of its C–119's for modification and limited reconditioning.[180] As a result of a priority ef-

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fort the first modified C–119 was airborne on 18 April and 60 out of 82 possessed of this type aircraft were in commission at the end of April.[181]

The collapse of an important proportion of the 315th Air Division's strength was successfully overcome without diminution of airdropped supplies to the Eighth Army but it had serious repercussions in Fifth Air Force. The 21st Troop Carrier Squadron's C–47's went to Kimpo on 20 April, their mission being to furnish 140 tons of daily airlift support to the frontline airfields for the Eighth Army and to evacuate casualties.[182] Until the C–119's could be modified, C–46's of the 437th Troop Carrier Wing were used for airdrops, a somewhat less than desirable expedient since the C–46's had to make three or four passes over a drop zone to deliver their cargo and, even with such caution, three of the C–46's suffered substantial damage when bundles were swept into their stabilizers.[183] During April, moreover, minimum flying facilities were constructed at Hoengsong (K–46), and, although endangered by surrounding mountains and the crude runway, 30 C–54's and 11 C–46's hauled an emergency lift of 325 tons of POL to K–46 on 24 April. Five days later, 42 C–54's, 15 C–46's, and 17 C–119's lifted a grand total of 501 tons of ammunition into Korean airstrips. On 30 April and 1 May a total of 1,562 tons of ammunition was flown to Kimpo.[184] But while the Eighth Army got an emergency priority for its airlift, the Fifth Air Force suffered during the period of reduced transport capability. Logistically, the Fifth Air Force had been operating on a somewhat close margin and approximately 95 per cent of its aircraft support items were in such short supply that they had to be closely controlled and shipped to using Korean air units by air. With the reduction in air transport capability it was difficult to get this supply support delivered in needed amounts; the experience during this emergency, as well as other occasions when the 315th Air Division was forced to stand down a part of its effort in preparation for airborne missions, demonstrated that either the Fifth Air Force or the Far East Air Materiel Command should have possessed sufficient organic airlift to permit the necessary air logistical support without interruptions for Army support.[185]

Fortunately the C–119 capability had been recovered by 16 May, the date when all transport groups were notified that maximum effort would be made to put as much ammunition and other army supplies into the forward airstrips as was possible in order to stem the second Communist assault. As General Van Fleet later explained, the ammunition supply of the Eighth Army in Korea, never as great as he would have liked, had fallen below a danger point, and steadily-firing guns had to be fed by an airlift from Japan.[186] Pressing all available aircraft into service, the 315th Air Division for 10 days regularly carried tonnages in excess of 1,000 tons. By 23 May with 222 aircraft on hand, the 315th flew 409 sorties with 1,534.2 tons, thus exceeding its stated maximum capacity of 1,291 tons. The great bulk was ammunition and POL, nearly all of it being laid down at Kimpo and Hoengsong.[187] At one time during the second phase of the Chinese offensive, Hoengsong was only six miles behind the X Corps command post, and during the several days of furious fighting, trucks stacked up 50 to 100 at a time waiting to take the ammunition off the transport planes and carry it to firing batteries.[188] Late in May another forward airfield (K–47) was readied for use at Chunchon, a 3,000-foot gravel-and-clay-surfaced runway which had been scraped out in a burned section of the town. This mountain-surrounded field was opened on 2 June; and, extended to 4,200 feet, it was ready for C–54's with emergency airlift support on 10 June.[189] Despite its operational handicaps, the 315th Air Division, by airlift and airdrop, delivered to Korea 15,900.6 tons in April, 21,300.2 tons in May, and 22,472 tons in June.[190] The aerial shipments of ammunition swelled the volume of Eighth Army fire, contributing mightily to the extremely heavy casualties inflicted upon the Communist armies.

The Communists Propose Cease-Fire Discussions: By mid-June 1951 all Communist

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efforts to drive UN forces from South Korea had met failure, and, after the debacle of their spring campaign, the Communists were themselves on the brink of a military disaster. On 23 June 1951 in a New York radio address, Jacob A. Malik, USSR representative at the UN, proposed cease-fire discussions. On 25 June—the anniversary of the initiation of Korean hostilities—General Ridgway broadcast a message to the Chinese Communist forces, professing to find it difficult to understand why their leaders continued in aggression when they were clearly incapable of destroying the UN forces in Korea.[191] Ridgway proposed a meeting between UN and Communist representatives, suggesting that the place of meeting should be aboard a hospital ship in Wonsan harbor, but the Communists, while accepting the proposal for cease-fire talks on 1 July, suggested that Kaesong should serve as the place of conference.[192] The Korean hostilities were entering a new phase, but air operations would continue unabated: "Combat operations," enjoined General Weyland, "will continue at the normal rate until otherwise directed." [193]

Within slightly more than seven months the UNC had so badly defeated the Chinese Communist forces that they realized the futility of longer continuing offensive operations, this despite the fact that their manpower greatly outnumbered UN ground forces. Of course, fire and movement on the part of the Eighth Army had contributed to the UN success, the fire inflicted battlefield casualties upon the Chinese and the ability to maneuver preserved friendly ground troops from overwhelming enemy assaults. But there was more to the UN victory than the ground battle: "Events since 25 June 1950," wrote General Weyland, "have clearly indicated that air operations have been one of the most decisive elements in stopping the enemy's offensives and reducing his capacity to wage ground warfare." [194] Under the favorable circumstance of air superiority, UN air forces had inflicted tremendous destruction upon the Communist armies with modest losses in crews and aircraft. In a little over four months in 1950 when the Red Koreans were the enemy, UN air forces claimed 39,000 hostile troops destroyed, about one-third of a little over 100,000 hostile combat effectives employed in Korea. During the months of November 1950 through February 1951, after the entry of the Chinese Communists into the conflict, UN air claimed destruction of 74,446 enemy troops. During the Red buildup and attacks in the spring of 1951, the UN air forces between March and June 1951 claimed destruction of another 43,105 enemy personnel. Thus in the first year of the Korean hostilities, UN air power estimated that it had killed some 156,551 Communist troops.[195] Naturally enough, these air claims could not be exactly checked by a count of bodies but there was evidence to indicate that they were conservative. Basing its finding on information obtained in a mass interrogation of North Korean POW's, a GHQ FEC study credited UN air with killing 49,527 Red soldiers (rather than the 39,000 claimed) during the first four months of the war.[196] UN air action also took a heavy toll of enemy war materiel; FEAF alone claimed destruction of 868 tanks, 1,655 field guns, 393 locomotives, 4,650 railway cars, and 15,522 vehicles as of 30 June 1951 [197] Viewed in terms of the destruction of Red personnel and materiel, UN air losses were minute: during the first year of hostilities FEAF, the largest of the UN air forces, sustained 631 personnel casualties, including 496 airmen killed or missing, and lost a total of 481 aircraft from operational causes, of which only 246 were destroyed by enemy action.[198]

Although the surface strategy employed by the UNC had not always permitted air to achieve its maximum capabilities, UN air power had nevertheless been the decisive element of force which had allowed the UNC to attain a favorable ground decision. The maintenance of UN air superiority had at once allowed the UN forces in Korea great mobility and simultaneously forced the Communists to move and fight at night. Air superiority had thus in itself not only secured UN forces against hostile air attack but it had interdicted enemy movement both at the battle

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lines and far to the northward on the main supply routes. Air interdiction missions had destroyed or impeded the movement of enemy troops, equipment, and supplies before they reached the battle zone. With diligence and long-enough periods of time, the Chinese had been able to concentrate stockages of supplies near the front lines in widely dispersed dumps, and with these supplies they were able to support short and intensive periods of all-out ground combat In each case, however, the Communists had been compelled to take heavy losses, both to their manpower and supplies, when they mounted ground offensives, losses inflicted by coordinated air and ground firepower Each Chinese offensive had dwindled for want of supplies before it could bring decisive manpower to bear for a lasting ground decision. "Although close air support contributed," observed General Weyland, "the major effect upon the enemy was produced by air power applied in the rear of his front line combat zone." [199]

Having no hope for victory, nor prospect except to continue enormous losses in men and materiel, the Communists proposed cease-fire discussions. But even as the Reds negotiated to establish cease-fire talks they were shrewd enough to turn an advantage against the UN air power which had decimated their ground offensives: by demanding that the talks take place at Kaesong, a village lying just behind the battleline and on the main supply route southward from Pyongyang, they established new restrictions upon air action The neutral territory encircling Kaesong as well as the corridor established between Kaesong and Panmunjom, site of military working group conferences, was free from air attacks; this restricted area—called "the Holy Land"—greatly complicated Fifth Air Force operations [200] In the course of the truce talks, moreover, the Communist delegates showed themselves entirely conversant with the effect of UN air power on military operations. Lt Gen. Nam Il, chief North Korean delegate, was extremely vocal as to the effect of UN air operations during the discussion of an armistice demarcation line in August 1951. Vice Adm. C. Turner Joy, chief UN delegate, argued a proposition that any demarcation line had to be fixed somewhat further north than the actual main line of ground contact; the existing ground front, Joy reasoned, was "the result of the action of our ground forces, combined with only a portion of our air and naval operations" At the conclusion of an armistice the UN would cease air attacks in the enemy's rear areas and the Communists would be able to build up at the battle line without hindrance; to keep military advantages even, Joy argued that the Reds would have to compensate for the cessation of the rear-area attacks by withdrawing their ground forces a short distance Although his bombastic claims of atrocity somewhat obscured his logic at times, Nam Il replied· "I would like to tell you frankly that in fact without direct support of your tactical aerial bombing alone your ground forces would have been completely unable to hold their present positions. It is owing to your strategic air effort of indiscriminate bombing of our area, rather than to your tactical air effort of direct support to the front line, that your ground forces are able to maintain barely and temporarily their present positions." Nam Il's choice of words was not entirely clear· he evidently considered "strategic air effort" to mean both air attacks against the Communist industrial capacity and rear area interdiction of enemy movement while "tactical air effort" was the close support effort, but he made one point clear by reiteration: "Without the support of the indiscriminate bombing and bombardment by your air and naval forces," he stated and repeated, "your ground forces would have long ago been driven out of the Korean peninsula by our powerful and battle skilled ground forces." [201]

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Chapter III

PROBLEMS OF THEATER AIR FORCE EMPLOYMENT

At the beginning of Korean hostilities in June 1950 the expectation within the Far East Command had been for an early victory, and again in November 1950 the defeat of the North Korean Peoples' Army had seemed to herald a successful conclusion of the conflict. Under such conditions of optimism, existing command systems in the Far East had been modified to accommodate the war mission and to handle the influx of new units, many of which were ordered to the combat theater on temporary duty status. Aircraft and air facilities had also been utilized on a "make do" basis, which, while admittedly inefficient, served to meet the series of crises occurring during the first year of Korean hostilities During the second year of the Korean conflict—even though peace talks were underway at Kaesong—FEC leaders were permitted little optimism regarding an early end to the war; instead, continued large-scale augmentations of Communist air and ground forces demanded that the UN Command revise its command establishment and acquire the potential necessary for an extended war.

COMMAND ORGANIZATION AND RELATIONSHIPS

The Far East Command Mission: In June 1950 the primary mission of the FEC was the defense of its area, a region including Japan, the Ryukyus, the Bonin-Volcano islands, the Marianas, and U.S. installations in the Philippines, and, as General MacArthur later observed, "until the President's great pronouncement to support the epochal action of the United Nations, had no slightest responsibility for the defense of the free Republic of Korea."[1] The FEC also served as an occupation force for Japan, and General MacArthur doubled in duty as Supreme Commander Allied Powers (SCAP). Pursuant to an enabling resolution of the UN on 7 July 1950, President Truman additionally designated General MacArthur to command the UN forces in Korea, and the United Nations Command was established on 24 July 1950. Other than its resolution of 27 June 1950 recommending that member nations "furnish such assistance to the Republic of Korea as may be necessary to repel the invasion and restore international peace and security in the area," the UN Security Council provided no directive for the conduct of military operations, preferring that General MacArthur receive his instructions from the United States, which had consented to act as the UN's executive agent for matters dealing with the Korean conflict.[2] No new staff was established for the UNC, but the FEC staff immediately assumed the duties of the unified command in simultaneous positions of responsibility.

As the war in Korea continued, the missions of the Far East Command were gradually consolidated. Security responsibility for the Marianas and Bonin-Volcano Islands was passed to the U.S. Pacific Command on 16 April 1951, the JCS having accepted CINCFE's recommendations that Air Force units and facilities in the Marianas should remain under

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FEAF control.[3] In July 1951 the JCS made known a further decision to transfer to the Commander-in-Chief Pacific Command (CINCPAC) the responsibility for defending Formosa, the Pescadores, and the Philippines, and after a long study the mission was at last transferred on 15 March 1952. Although responsibility for the protection of air communications and base facilities in this area was assumed by CINCPAC, command and operational control of all FEAF units and facilities remained with the commanding general FEAF.[4] The conclusion of peace with Japan brought an additional reduction in the responsibilities of CINCFE. At the official promulgation of the Japanese peace treaty on 28 April 1952, CINCFE laid by his authority as SCAP and rescinded the occupation duties of the Far East Command.[5] This series of command redefinitions focused the mission of the Far East Command upon the defense of Japan and the Ryukyus and, as the United Nations Command, upon the conduct of the war in Korea.

Time and controversy brought changes in the men who commanded the UNC/FEC, and whose personalities inevitably affected the organization and conduct of the war against Communism in the Far East. By direction of the President of the United States, General Matthew B. Ridgway on 11 April 1951 replaced General MacArthur as CINCFE/CINCUNC and SCAP. Coincident with the Japanese peace treaty, General Ridgway was relieved as CINCFE/CINCUNC and appointed as Supreme Allied Commander Europe, a decision announced on 29 April 1952. The successor to the duties in the Far East was General Mark W Clark, who had commanded the U.S. Fifth Army in Italy during World War II and who had lately served as Chief of Army Field Forces General Clark assumed his duties in the Far East on 12 May 1952.[6]

Internal Organization of the FEC: The headquarters structure of the Far East Command at the outbreak of Korean hostilities was actually little more than a relic of the same structure which General MacArthur had utilized during World War II As was the case with other theater commanders, the JCS had directed MacArthur on 14 December 1946: "Each unified commander will have a joint staff with appropriate members from the various components of the services under this command in key positions of responsibility." The main action in the Far East was the establishment on 20 August 1949 of a Joint Strategic Plans and Operations Group under the G–3 of GHQ FEC with the duty "to assist and advise the Commander-in-Chief, Far East, on matters pertaining to his exercise of unified command over Army, Navy and Air Force forces, allocated to the Far East Command."[7] Since it comprised three Army officers, three Navy officers, and two Air Force officers, the JSPOG was frequently cited as evidence that GHQ FEC was a joint staff, but it was apparent both from the statement of JSPOG's functions and from the small number of assigned personnel that the group could not serve in lieu of the joint staff contemplated by the JCS.[8] By the same type of logic the G–2 Section of GHQ FEC was reorganized on a "Joint Basis" in January 1948 by the assignment on the part of FEAF and NAVFE of "one suitably qualified Air and Naval Intelligence officer . . . to act as the Air and Naval representatives and experts, for the various publications of Theater Intelligence"[9] Unification, at the highest command headquarters level, had never reached the Far East; yet General MacArthur later testified: "In the Far East the integration of the three fighting services has been as complete as I could possibly imagine."[10]

Absence of unification principles was nowhere more clearly demonstrated than in the functioning of FEC headquarters. In theory the three major commands of the FEC were the Army Forces Far East (AFFE), the Naval Forces Far East (NAVFE), and the Far East Air Forces (FEAF), but in actuality General MacArthur had never organized an Army Forces Far East as the coequal command with FEAF and NAVFE. Instead it was a shadow body, commanded by CINCFE, with the members of GHQ FEC functioning as the staff members of the top Army headquarters. The commanding general of each major Army command reported directly to CINCFE. Thus

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when UNC/FEC got around to designating its major subordinate commands on 30 October 1950 they were the Eighth Army, X Corps, the Japan Logistical Command, Headquarters and Service Command GHQ FEC, the NAVFE, and the FEAF.[11] The X Corps lost its major command status effective on 26 December 1950, following its withdrawal from Hungnam and its assignment to the Eighth Army.[12] Heavily burdened with the conduct of Army affairs and manned predominately with Army officers, the GHQ FEC/UNC staff was inevitably dominated by Army thinking.

In view of General MacArthur's opinion that he possessed "integration of the three fighting services . . . as complete as I could possibly imagine," it was not remarkable that no reformation of the command was undertaken as long as he served as CINCUNC/CINCFE. During the first month of General Ridgway's tenure, there were undertaken studies which sought a solution which would bring the GHQ FEC organization into consonance with the intent of the JCS unified command plan as set forth in JCS 1259/27. At this time FEAF stated its concept of necessary remedial action: [13]

> This headquarters favors the establishment of an Army command, and a truly joint staff as distinguished from an integrated staff. Inherent in this position is the assurance that the views of the service commanders are presented to the unified commander without revision at successive joint staff levels The *raison d'etre* of a unified commander is to provide direction by one person of two or more services based upon the advice of the service commanders concerned, and to resolve any difference between them that may arise. Any theater organization which does not require performance of these functions is incompatible with the spirit of the unified command. . . The proposed joint staff should be relatively small Its functions should be limited chiefly to policy considerations. Operations at this level should be held to the minimum. The service commanders should review major staff sections and resolve differences as practicable, and then present their views to the unified commander.

FEAF also suggested that CINCFE could more readily perform his functions as head of a unified command if he were not directly responsible for the many details of Army command and administration. Despite this study, no reformation of the GHQ FEC organizational structure was effected during General Ridgway's tenure.*

Practically all of the inter-service difficulties which arose during the Korean conflict could be traced to misunderstandings which probably would never have existed had UNC/FEC possessed a joint staff at the beginning of hostilities. Many of these difficulties have been noted in an earlier study,† but it is significant here to note that the solution of most of these problems was often on an improvised and illogical basis. The control of transportation is one case in point. as was entirely proper for the best use of a scarce service, the allocation of air transport space was strictly controlled at theater level; on the other hand, land and sea transport were also frequently insufficient to the need for them, but these forms of surface transportation were controlled and allocated by the Japan Logistical Command within Japan and by the Eighth Army within Korea.[14]

Covert and clandestine activities was another function gravely affecting the lives of FEAF and NAVFE airmen who were forced down within hostile territory, yet this function was controlled by another command and used for a different purpose. Without formal coordination with FEAF, GHQ FEC on 28 November 1951 established an organization known as Covert, Clandestine and Related Activities in Korea (CCRAK) and charged it to function as a "single headquarters . . . to direct all Army, Navy, Air and CIA [Central Intelligence Agency] operations of this nature . . in Korea." CCRAK was placed under the command of CINCFE but with G–2 GHQ

*When General Clark took command of UNC/FEC on 12 May 1952 he saw good reasons why his headquarters "should be a joint, tri-service operation, rather than an army project" [Mark W Clark, *From the Danube to the Yalu* (New York Harper & Brothers, 1954), p 133] On 20 August 1952 Clark therefore announced his intention to organize a small joint headquarters for the UNC/FEC and to establish the Army Forces Far East (AFFE) on the same major command level with FEAF and NAVFE On 1 October 1952, AFFE was activated, and effective 1 January 1953 the FEC joint staff undertook full operations (FEC Comd Rpts, Aug 1952, p 2 and Sept 1953, p 3, G O #169, FEC, 10 Dec 1952) This FEC reorganization will be treated in detail in AHS-127, USAF Operations in the Korean Conflict, 1 July 1952-27 July 1953

†*See* AHS-71, pp 12-13, 27-29, 35-37, 60-64, 114-17.

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FEC supervision. Since G–2 GHQ FEC was at the time also G–2 for the Army forces in the FEC, this directive in effect negated the joint command channels of component force commanders to CINCFE, purportedly established a joint task organization not in consonance with JCS criteria for such an organization, and put executive agency control for clandestine operations upon a component force commander (CINCFE as CG AFFE). The natural result of this organizational framework was that CCRAK, working under direct supervision of G–2 which exploited it for intelligence gathering, did not wish to compromise its agents by permitting them to assist evading Air Force and Navy airmen In the course of the Korean conflict not over 15 airmen could state that assistance from indigenous personnel resulted in their successful return to U.S military control.[15]

Service Missions in Korea: That Generals MacArthur and Ridgway during their tenure as CINCUNC/CINCFE chose to utilize a theater headquarters staff of Army officers, who additionally administered the theater Army forces, appears inconsistent with the concept of unified employment of Army, Navy, and Air Force forces. Under the concept of unification the theater commander, rather than any single military service, bears the responsibility for execution of the theater mission Each military service component contributes its own specialized capabilities to the attainment of the theater mission and in so doing assists the other services; however, no single service exists solely or primarily for the support of another service. The conduct of war by all forces within a theater of operations is thus a series of air, ground, and naval actions directed toward the accomplishment of the theater mission But both Generals MacArthur and Ridgway gave abundant evidence that they considered ground action to be decisive and it is evident that they did not doubt that the Eighth Army was their major instrument of power; during their administrations the prevailing theater opinion, often expressed and always implied, was that "the Eighth Army is responsible for winning the Korean war, and . . the role of other Services is to support it in its effort."[16] In view of this prevailing opinion it is not remarkable that the UNC/FEC headquarters was not reorganized as a joint tri-service agency but rather remained "an Army project."

The best that could be said of the air mission in Korea during the two years between June 1950 and June 1952 was FEAF's own statement that it was charged by CINCFE to: "Conduct air operations as a part of the UNC to assist in the destruction of North Korean military forces."[17] Under General MacArthur, FEAF's supporting role to the ground battle was not as obviously stated in the formal operations plans and orders as it was in frequent oral and written directives issued by CINCFE or his staff, but in April 1951 General Ridgway, as a first order of business when he took command of UNC/FEC, issued mission letter assignments which frankly stated the supremacy of the Eighth Army mission in Korea and the supporting roles expected from FEAF and NAVFE. "Your mission," Ridgway informed the commanding general, Eighth Army, "is to repel aggression against so much of the territory (and the people therein) of the Republic of Korea, as you now occupy and, in collaboration with the Government of the Republic of Korea, to establish and maintain order in said territory." In the execution of this mission the commanding general, Eighth Army, was to be guided by the following prescriptions:[18]

> You will direct the efforts of your forces toward inflicting maximum personnel casualties and materiel losses on hostile forces in Korea, consistent with the maintenance intact of all your major units and the safety of your troops The continued piecemeal destruction of the offensive potential of the Chinese Communist and North Korean armies contribute materially to this objective, while concurrently destroying Communist China's military prestige
>
> You will maintain the offensive spirit of your Army and retain the initiative, through maximum maneuver of firepower, within the limitations imposed by logistics and terrain, and without undue sacrifice of men or equipment.
>
> You will exploit the enemy's every weakness and take advantage of every opportunity to show the world the true measures of the combat effectiveness of the forces opposing you

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You will take adequate measures during all operations to insure the security of your command against any hostile maneuver or technique. . . .

Acquisition of terrain in itself is of little or no value.

You will support the Commander, Naval Forces Far East and Commanding General, Far East Air Forces in the discharge of their assigned missions.

General Ridgway instructed COMNAVFE that his primary missions relating to Korea were to conduct naval operations to: [19]

Maintain control of the sea in the Far East Command

Provide Naval defense for Japan and other areas under control of CINCFE and CINCUNC

Maintain Naval blockade of Korea.

Provide Naval support for the Eighth Army and Far East Air Forces in the conduct of their operations in Korea.

Protect shipping on the high seas within the Far East Command.

Provide Naval support as directed for the Far East Air Forces in operations outside of Korea and for the GHQ reserve corps, the Japan Logistical Command, the Ryukyus Command, and the Philippines Command (Air Force)

Perform reconnaissance missions under provisions of the theater reconnaissance plan, 10 August 1950

Relative to Korea, General Ridgway instructed the commanding general, FEAF that his primary missions were to conduct air operations to: [20]

Maintain air superiority over Korea and waters adjacent thereto.

Provide general air support for the United Nations forces in Korea, to include: (A) Close air support of surface forces. (B) Interdiction, including isolation of the battle area (C) Air transport, troop carrier, and air evacuation (D) Special missions, including electronic countermeasures, psychological and clandestine

Assist in maintaining the security of the Far East Command, and of United Nations forces in Korea, including the protection of air communications within the theater.

Provide air defense of the Far East Command and the forces and facilities assigned thereto

Provide air support as directed by CINCFE, or as arranged with local commanders, for Naval Forces Far East, GHQ Reserve Corps, Japan Logistical Command, Ryukyus Command and PHILCOM (Air Force).

Perform reconnaissance missions under provisions of the theater strategic reconnaissance plan, 10 August 1950

Be prepared to conduct airborne operations as directed by CINCFE.

In each of the three letters of instruction, General Ridgway cautioned that the instructions would provide the basis for planning in the Far East Command. Significantly enough, only Eighth Army was charged to repel aggression and to inflict maximum personnel casualties and materiel losses on the Communist forces in Korea; FEAF and NAVFE were directed to support the predominant ground effort in Korea.

Relationships between FEAF and NAVFE: Under the USAF conception of unified military action the control of all air forces assigned to or employed in a theater of operations is vested in a single theater air commander. Such centralized control is essential since it permits timely and maximum utilization of essentially scarce air effort in the performance of theater air tasks. Cognizant at the very beginning of the Korean hostilities that some form of centralized control of Air Force, Navy, and Marine aircraft was required not only for maximum effectiveness but for safe flying in the combat zone, General Stratemeyer on 8 July 1950 had requested that, with the exception of units utilized in naval missions, all Navy and Marine land-based and carrier-based aviation operating over Korea should be placed under his operational control as commander FEAF. Stratemeyer construed operational control to mean nothing more than "the authority to designate the type of mission, such as air defense, close support of ground forces, etc., and to specify the operational details such as targets, times over targets, degree of effort, etc , within the capabilities of the forces involved." [21] Instead of granting this clear-cut authority, the chief of staff GHQ FEC issued the following directions in a letter bearing a file date of 8 July 1950: Commander FEAF would have command or operational control of all aircraft in the execution of the FEAF mission as assigned by CINCFE. COMNAVFE would have command or operational control of all aircraft

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in execution of missions assigned by CINCFE to NAVFE. "When both NAVFE and FEAF are assigned missions in Korea, coordination control, a CINCFE prerogative, is delegated to the Commanding General, FEAF" [22] What was meant by the strange term "coordination control" was never clear, nor did CINCFE ever choose to clarify the meaning of the term, and such working understandings of "coordination control" as evolved proved too elusive to produce any desirable results. "As the war progressed," noted a USAF evaluation board, "it became increasingly apparent that 'coordination control' was a cumbersome makeshift for delegation, by the theater commander, of clear-cut control authority over all air operations to a single commander." [23]

Additional language in the 8 July 1950 "coordination control" directive indicated that CINCFE meant to exercise the basic coordination of NAVFE and FEAF air effort by accomplishing basic air target selection within GHQ FEC. To this end a GHQ Target Analysis Group was formed on 14 July and made responsible to the assistant chief of staff G–3 FEC. Within two weeks, however, this group had shown its inability to handle the problem of air targets and priorities: out of some 220 primary and secondary targets designated by the group during the period 17 July through 2 August, some 20 per cent of the targets came from defective maps and did not physically exist. As a result of strong protest by Generals Stratemeyer and Weyland, the GHQ Target Analysis Group was superseded on 22 July by a GHQ Target Selection Committee, composed of the deputy chief of staff FEC, the assistant chief of staff G–2 FEC, the vice commander for operations FEAF, and a NAVFE representative. This GHQ Target Selection Committee met periodically for the next several months, discussing and recommending the most profitable employment of UN air power and evaluating such targets as were recommended for attack by FEAF and NAVFE. The bulk of air target research and selection was actually restored to the FEAF target section, which was the only agency in the theater currently capable of handling such work. Since the GHQ Target Selection Committee gradually ceased to function, the FEAF Target Committee eventually became, in fact if not in name, the theater medium through which air campaigns were laid out against target systems in accordance with basic programs approved by CINCFE and commander FEAF.[24] In the absence of a joint tri-service staff, GHQ FEC proved unable to provide the effective centralized direction required for a proper coordination of UN air action over Korea.

Under the 8 July directive, commander FEAF made the Fifth Air Force responsible for the coordination control of tactical air operations, including the support of the Eighth Army. CINCFE twice elected during 1950 to attach the 1st Marine Air Wing to the X Corps for the support of independent amphibious operations at Inchon and Wonsan,* with the result that during these periods no one responsible air commander possessed even the nebulous over-all coordination control authority in Korea. Moreover, until General Weyland vigorously protested the arrangement, the GHQ staff apparently intended to maintain the 1st Marine Air Wing as a separate air command attached to and supporting X Corps. Effective with the disestablishment of the Wonsan objective area, however, CINCFE returned coordination control of the Marine wing to FEAF which promptly passed it to Fifth Air Force. In the period following the retreat southward in December 1950, the Fifth Air Force assigned tasks, designated objectives, and in general took operational control over the Marine air units, through responsible Marine air commanders, as required for the accomplishment of the assigned mission in Korea [25] Operating thenceforth under the Joint Operations Center in much the same manner as did Fifth Air Force wings, the Marine air wing caused little organizational difficulty and effectively exploited the combat potential of its aircraft.

Coordination control of the carrier-based air units of NAVFE's Seventh Fleet (Task Force 77) presented more difficult and long enduring problems, many of which were never

*See AHS–71, pp 60–70, 73–79.

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solved during the three years of the Korean hostilities. Thus on 9 April 1951 General Weyland wrote: "The term 'coordination control' has never been accepted by the Navy to include any degree of control. To achieve any degree of coordination, this headquarters has resorted to time consuming suggestions, cajolery, request, and conference, and this headquarters is then seldom certain that air tasks requested of the Navy will be accomplished." [26] The most pressing initial problem was to coordinate naval fast carrier task force effort with that of the Fifth Air Force in support of the Eighth Army. During the disorder of the critical summer of 1950, Eighth Army did not hesitate to call directly upon GHQ FEC for the support of Task Force 77's fast carriers, instead of properly making its requests known through the Joint Operations Center And GHQ FEC without compunction ordered COMNAVFE to have Task Force 77 fly the support, often without informing FEAF of the action. The result was some rather severe mix-ups when several deck-loads of carrier aircraft suddenly materialized over the front lines, seeking targets from TACP's who had not known Navy planes were coming. Beginning in August 1950, a Navy liaison officer was sent to Eighth Army, and there by local arrangement he was placed in the JOC, where he began to coordinate Navy attacks with those of the Fifth Air Force. In the absence of direct communications between the JOC and Task Force 77, however, strike requests had to be routed from the JOC to the task force through NAVFE in Japan, necessarily a time-consuming procedure.* There was some thought that Task Force 77 was so lacking in sympathy with the tactical air control system in Korea as to make it very difficult for it to solve the mechanical problem of putting in direct communications with the JOC.[27]

An extemporary method of coordinating Fifth Air Force and Task Force 77 effort in support of UN ground troops in Korea was finally thrashed out by a FEAF-NAVFE conference on 3 November 1950, the means being additionally developed in subsequent talks between the representatives of the operating commands In January 1951, six months after fast carrier aircraft had begun to operate over Korea, Task Force 77 was able to arrange radio channels with the JOC, and naval representatives began to visit the JOC to pick up ground intelligence and assist in planning missions. As a matter of policy, carrier pilots were given special sectors of the front for ground support and specific armed-reconnaissance route responsibilities.[28] These agreements were completely informal, and, in view of the geographical separation of land-based and carrier-based effort, represented no integration of available air effort. The JOC in Korea had no positive control for the assignment of close air support missions to carrier air units. Navy task forces operating in support of the ground fighting undoubtedly furnished air support of inestimable value, but the withdrawal of naval air strikes on short notice or no notice at all frequently forced the Fifth Air Force to make up, often with considerable difficulty, the effort cancelled by the Navy. The JOC seldom received the reports of targets attacked and mission results from Task Force 77 which it required in order to manage efficiently the close support effort [29] Until June 1953, a month before the end of Korean hostilities, the Navy chose to keep to very informal agreements,* apparently because of a belief that it had to hold itself ready to execute its primary mission of controlling the seas. Thus the commander Seventh Fleet remarked that "diversions such as supporting the air forces or Army effort must be subordinated to a category of 'as feasible.' " [30]

*See AHS-71, pp 28-29

*In late June 1953 commander Seventh Fleet agreed to provide a Naval Member JOC (NMJ) whose duties were analogous to those of the Fifth Air Force director of operations NMJ was specifically charged to select targets for naval aircraft in close and general support of Eighth Army and to coordinate operations with the Fifth Air Force He was also designated senior naval liaison officer with the Fifth Air Force, and, as such, operated a naval air operations center which maintained current information regarding the movements of fleet naval aircraft and the location of Navy surface units These actions permitted integration of land- and carrier-based air units across the entire battle line (*See* rpt, Joint Air-Ground Operations Board, sub Report on Joint Air-Ground Operations Conference held at Headquarters, Fifth Air Force, 8-22 August 1953)

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When Seventh Fleet carrier-based aircraft were used against Korean target systems which offered neither close nor general air support to the Eighth Army, commander FEAF customarily arranged for Seventh Fleet participation by making a request either through CINCFE or directly to COMNAVFE. FEAF gradually assumed most of the responsibility for implementing CINCFE tasks into air campaigns, but FEAF and NAVFE remained coequals in the FEC structure and coordination of effort was achieved only through "time consuming suggestions, cajolery, request, and conference." The CINCFE directive issued in April 1951 requiring COMNAVFE to "provide Naval support for the Eighth Army and Far East Air Forces in the conduct of their operations in Korea" indicated that there was some superiority of the FEAF air mission in Korea, but this definition did not supersede the coordination control directive. On 14 July 1951, commander FEAF requested CINCFE to amplify the meaning of "coordination control," explaining that he understood it to mean: "That degree of control, of one service of another, necessary to effect a harmonious working together." Specifically, commander FEAF wished to exercise over naval air operations in Korea no more than "a degree of control that will assure the FEAF of being constantly and expeditiously informed of naval air location, capabilities, intentions, sorties flown, targets attacked, and results." Apparently CINCFE did not perceive a necessity for amplifying the original coordination control directive.[31]

In the absence of any mechanism permitting integration of FEAF and NAVFE air effort, FEAF planning almost invariably gave naval aircraft separate geographical areas of operations. Thus in early 1951 when the FEAF Target Committee planned and UN aircraft executed Interdiction Campaign No. 4, COMNAVFE agreed to assume responsibility for interdicting the targets furnished him in the zones covering Korea's east coast rail and highway systems In August 1951 when the comprehensive railway interdiction campaign was begun, NAVFE agreed to take responsibility for interdicting rail routes in east-central Korea.* As long as targets were of a nature permitting efficient attack by small formations of fighter-bombers this geographical coordination had some advantage in that Task Force 77's fast carriers usually lay off the east-central Korean coast where they were convenient to targets which would have stretched the range of Fifth Air Force planes. Such geographical coordination, however, did not permit massed employment of available UN air effort; the arrangements, moreover, were fundamentally defective in that no one air commander could be held responsible for the success or failure of an air campaign. On occasion General MacArthur was known to refer to General Stratemeyer as "the over-all air commander," but neither commander FEAF nor any other air officer in the FEC possessed such authority [32]

Under the fortunate condition whereby UN air forces controlled the air over Korea, the coordination control mechanism was resultant in an inefficient employment of available air power. It is nevertheless evident that the nebulous control arrangement produced such a high degree of confusion, especially during the first several months of hostilities, that a first-rate enemy air power would have seriously damaged, or perhaps have overwhelmed, the UNC. In the spring of 1951 when a growing Red air order of battle jeopardized the FEC, General Weyland warned that in the event of full-scale air hostilities "immediate and positive direction and control of all friendly air resources operating over Japan and Korea would be a vital necessity" Weyland felt certain that " 'coordination control' would be inadequate to such a necessity." [33] The agreements for air coordination in defense of the Far East theater, issued over the signatures of General Stratemeyer and Vice Adm C. Turner Joy on 26 March 1951, nevertheless exempt the Seventh Fleet's fast carriers, the most significant portion of the NAVFE air capability. For emergency air defense use, all shore-based Navy and Marine fighter aircraft were subject to the operational control of the air defense com-

*See Chap. V, pp. 140-49.

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mander, when not committed to higher priority CINCFE missions, but carrier-based fighter aircraft were an integral part of the fleet and would not normally be pre-committed to the operational control of the air defense commander. In the event that carrier-based aircraft became available for air defense purposes, the air defense commander would be so advised by the appropriate Navy commander.[34] A continuing reluctance on the part of NAVFE to disclose any planned employment of carrier air units long threatened the validity of FEAF efforts to draw up realistic plans for meeting all-out air hostilities. Not until April 1951 was FEAF able to obtain any firm information regarding the planned employment of carrier air in a war emergency, but finally in the course of a FEC war-gaming exercise NAVFE representatives noted that:

> Fleet units operating on the west coast of Korea in the interdiction and CAS [close air support] program are operating in an area which would be considered untenable if we were at war with China and/or Russia in view of the heavy air concentration in the Port Arthur area and restricted waters of the Yellow Sea.

In the event of general hostilities, NAVFE representatives further observed that: "The operation of TF 77 must not be confined to a restricted area such as the Sea of Japan since such a restriction will nullify its capability to perform its basic mission." [35] Indications of the Navy plans for war emergency operations in the Far East were additionally revealed in a Seventh Fleet report issued on 11 February 1952: [36]

> Because the Navy controls the sea in the Far East without opposition, it presently enjoys the luxury of being able to devote almost all of its combat strength to assisting the Ground and Air Forces in Korea. [In a general emergency] we will probably have to abandon the Yellow Sea and Sea of Japan in order to get greater mobility . . . In any case, we must secure Tsushima Straits The size of such a project makes it mandatory that the Seventh Fleet devote its whole strength to accomplishing it. . . . In summary, the Navy can only achieve success in its role if it confines itself to its primary duties Diversions such as supporting the air forces or Army effort must be subordinated to a category of "as feasible."

Air Force evaluations of the UNC organizational structure have correctly stressed that the structure's lack of a joint staff at theater headquarters and the absence of any over-all theater air commander prevented the maximum utilization of available air power. These evaluations, however, have assumed that it was the defects of the UNC/FEC organizational structure which made impossible an imaginative or even efficient employment of UN air power. It may be more profitable to speculate as to whether this UNC/FEC organizational structure, as defective as it was to the airman, was not a direct manifestation of the theater commanders' belief that the ground battle was decisive and that air power was due to support the ground battle. Viewing air power as a supporting force to the decisive surface battle, General MacArthur and his staff saw nothing fundamentally wrong with compartmentalization of air power. General Ridgway instructed the Eighth Army to destroy the Communist ground armies, and frankly directed FEAF to support this ground effort. Believing in the supremacy of the Army mission, neither MacArthur nor Ridgway thought it inappropriate that they should personally command not only the theater but its Army forces, without the subterfuge of an intermediate Army headquarters. Viewing air power as a supporting agency to decisive ground operations, Generals MacArthur and Ridgway naturally did not have the same concern for its centralized control as did the air officers who saw air power in its true sense, not as a supporting force, but as a decisive striking force. Thus the UNC/FEC organizational structure, in which an Army-manned theater staff utilized packets of air power primarily for ground support, was not inconsistent with the CINCFE concept that ground action was predominant; it was nevertheless inconsistent with principles of unified military command proven in World War II whereby an impartial theater commander, assisted by a tri-service staff, utilizes each military service component in a manner permitting it to maximize its individual capabilities against the enemy while simultaneously supporting the other service components.

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INTERNAL REORGANIZATION OF FEAF

Japan Air Defense: The rapid expansion of the FEAF mission from peacetime defense to countering Communist aggression thrust an intolerable burden upon the Fifth Air Force. It was immediately expected to continue its air defense, occupation, and logistical duties in Japan, as well as to fight in Korea. Supervision of an expanded base-facilities construction program in Japan became a Fifth Air Force responsibility. By November 1950 some 25 air bases, 11 combat wings, a reconnaissance and a tactical control group, plus numerous smaller units were reporting directly to the Fifth Air Force. A partial solution had been the division of Fifth Air Force headquarters into two echelons: Fifth Air Force in Korea which went into combat and Fifth Air Force Rear which managed affairs in Japan. The division of a single headquarters nevertheless posed some strain to good management of divergent air tasks. On 18 November 1950, General Stratemeyer, reviewing the excessive responsibilities of the Fifth Air Force, requested authority from USAF for the activation of an air division at Nagoya.[37]

The Fifth Air Force activated the 314th Air Division at Nagoya on 1 December 1950, under the command of Brig. Gen. Delmar T. Spivey.* The three principal duties specified for the 314th Air Division were the air defense of Japan, logistical support for Fifth Air Force combat efforts in Korea as well as for all assigned and attached units on Fifth Air Force bases in Japan, and the control of the airfield construction program in Japan.[38] Simultaneously with the activation of the 314th Air Division, General Partridge concentrated Fifth Air Force headquarters in Korea.

At the time of the organization of the 314th, General Partridge proposed that it report directly to FEAF, but General Stratemeyer had preferred that it be assigned to Fifth Air Force, reasoning that the air forces located in Japan and Korea were mutually dependent for accomplishing both tactical air and air defense missions with their limited available resources. The air defense of Japan nevertheless assumed additional significance as the Communists built up their air potential in the Far East. In April 1951, Brig. Gen. J. V. Crabb, FEAF deputy for operations, warned that the Soviet Union was capable of initiating a substantial surprise attack against Japanese bases. General Spivey also had misgivings, and pointed out that a successful enemy air attack against the Far East Air Materiel Command shops and warehouses at Tachikawa "could paralyze the technical supply of . . . our forces."[39] Cognizant of the vulnerability of Japan to amphibious invasion, the JCS dispatched two National Guard infantry divisions to Japan, where CINCFE used them as a GHQ Reserve and later as XVI Corps. By early May 1951, moreover, the Fifth Air Force had plans afoot to move all of its combat units to Korean airfields; such a move would result in a lessened dependence upon the Japanese bases for the support of the Korean air war.[40]

A special study made by the 314th Air Division in March 1951 revealed that the missions of air combat in Korea and air defense in Japan were incongruously vested in Fifth Air Force. Delegation of both missions to one commander inevitably relegated the planning, implementation, and operation of the air defense of Japan to a position of secondary importance, for the Fifth Air Force staff was naturally preoccupied with the fighting in Korea Force commitments were also different: the air defense establishment would require a fixed system determined by geographical considerations, while the Fifth Air Force comprised a highly mobile tactical air striking force General Partridge fundamentally agreed with the advantages to be expected from a division of the two commands, but when the matter was again brought to his attention, he doubted that sufficient resources would ever be available to permit certain units to be designated for defense and others for tactical missions. General Stratemeyer, on the other hand, now approved the separation

**See* Chap I, p 38

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of the 314th Air Division from the Fifth Air Force as a change which would allow the most efficient utilization of forces available to FEAF, and on 18 May 1951 the 314th Air Division was accordingly established as an independent command subordinate to FEAF.[41] As such the 314th was charged to provide an air defense for Japan, to support the Fifth Air Force as mutually agreeable, to conduct joint training and support the XVI Corps, and to administer assigned Japanese air bases.*

Air Transport Reorganization: Like the supposedly temporary arrangement which had split the Fifth Air Force, FEAF had activated the FEAF Combat Cargo Command (Provisional) on 26 August 1950, with its headquarters at Ashiya Air Base. The commander of the transport organization, Maj. Gen. William H. Tunner, and most of his key headquarters personnel came to Japan on temporary duty orders, supposedly for 90 days' special assignment. Although it was made a major command directly responsible to FEAF, the Combat Cargo Command (P) possessed only the operational control of the troop carrier units, the Fifth Air Force being charged with their administrative and logistical support. As originally established, the Cargo Command controlled the 374th Troop Carrier Wing, the 1st Troop Carrier Group (a provisional two-squadron C–46 unit activated on 26 August 1950), and the 314th Troop Carrier Group. The 437th Troop Carrier Wing, arriving from the United States, was assigned to Fifth Air Force and placed under operational control of Cargo Command on 28 October, and the crisis in December 1950 brought to Japan the 61st Troop Carrier Group with two C–54 squadrons and the 4th Troop Carrier Squadron (62d Group), both organizations being attached for a supposed 60-day temporary duty.

Under General Tunner's direction, the FEAF Combat Cargo Command performed its mission admirably, but the prospect of continued hostilities in Korea made it imperative that FEAF troop carrier aviation be established on a permanent basis; on 29 December 1950 General Stratemeyer informed the USAF that the "temporary nature" of the Cargo Command was giving him "considerable concern." [42] Interrelationships between Fifth Air Force and Combat Cargo Command perplexed both organizations. With the activation of Cargo Command, the Fifth Air Force lost operational control of its 374th Troop Carrier Wing, but it was required to undertake the responsibility for manning all troop carriers and the bases supporting them. Such manning was based solely upon requirements stated by the Cargo Command, and Fifth Air Force often had to withdraw personnel from its other functions to meet troop carrier requests. According to a Fifth Air Force study, Combat Cargo Command always submitted urgent requirements "on the basis of what they thought they needed and assigned the first available body to the job regardless of . . . the individual's qualifications or pending requisitions." The Fifth Air Force had no ability to take corrective action against a laterally coequal command.[43] General Tunner also found the arrangement quite unsatisfactory for continuous operations: "We are limited to operational control of our subordinate units," he wrote, "which is all right for a short period of time, but after a while it becomes unwieldy. We are faced with administrative matters every day which we are not prepared to handle" [44]

Looking toward a permanent organization of air transport in the Far East, General Tunner recommended that the function should be subordinate to Fifth Air Force. If the Fifth Air Force would furnish the necessary personnel, Tunner believed that the temporary duty officers could be relieved in about two weeks and a working headquarters turned over to the command of Brig. Gen. John P. Henebry, who had brought the 437th Wing to Japan [45] General Stratemeyer held a different opinion on 6 January 1951: "As long as the ground situation remains up in the air," he informed Tunner, "I desire to retain my Combat Cargo Command separate from the Fifth Air Force and I desire that you continue as its com-

*For the subsequent history of the 314th Air Division and of its reorganization as the Japan Air Defense Force on 1 March 1952, *see* Air Defense of Japan, II (July–Dec. 1951) and III (Jan.–June 1952).

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mander." [46] General Stratemeyer also had in mind a permanent transport organization. on 29 December he had already requested USAF authority to activate an air division to control combat cargo, and he also wished to reorganize the 374th and 437th Wings on a four-squadron war basis. USAF approved most of the request but was unable to provide a fourth squadron for the 374th Wing. On 25 January 1951, FEAF therefore activated the 315th Air Division (Combat Cargo) and discontinued the FEAF Combat Cargo Command (P); like its predecessor, the 315th became a major subordinate air command, directly responsible to FEAF. The 374th and 437th Troop Carrier Wings and the 6122d Air Base Group at Ashiya were assigned to the 315th, but they were now attached to Fifth Air Force for administrative and logistical support except for assignment and promotion of personnel. The 1st Troop Carrier Group (P) was deactivated, the majority of its personnel and equipment being transferred to the 437th Wing to form the desired new 86th Troop Carrier Squadron. The TDY transport organizations—the 314th and 61st Troop Carrier Groups and the 4th Troop Carrier Squadron—were attached to the 315th for operational control and to Fifth Air Force for administrative and logistical support.[47]

As was contemplated, the 315th Air Division required an extended period in which to effect its reorganization. General Henebry nevertheless relieved General Tunner in command on 8 February 1951, and most of the other key staff officers were also relieved for return to their regular stations in the United States during the month. Lack of space at the already overcrowded Ashiya Air Base had caused movement of the 315th's headquarters to FEAMCOM Area "B" at Higashi Fuchu, near Tachikawa Air Base, on 2 February To the Fifth Air Force the 315th Air Division indicated an intention to assume its own administrative and logistical functions as rapidly as its organizational capabilities permitted, but a letter of agreement of 12 February 1951 covered the assistance which Fifth Air Force was to render in the meanwhile.[48] By 11 June 1951, when the separation of the 314th Air Division from the Fifth Air Force necessitated a new agreement with the 314th, the 315th Air Division had need for only the following assistance· civilian personnel, dependent housing and schools, general courts martial, post exchanges, air installations, and controller functions.[49] Most of these functions were subsequently assumed by the 315th Air Division. Further reorganizations of the internal force composition of the 315th would be the task of Col. Cecil H. Childre, who succeeded General Henebry on 26 February 1952, and of his successor, Brig. Gen Chester E. McCarty, who took command of the 315th Air Division on 10 April 1952.*

Changes in the FEAF Bomber Command: To direct the operations of the Twentieth Air Force's 19th Bombardment Group (M) as well as the several Strategic Air Command medium bombardment groups which were arriving from the United States, FEAF activated the FEAF Bomber Command (Provisional) on 8 July 1950. In deference to the fact that the medium bomber force would always be provided on a rotational basis by the SAC and the expectation that the 19th Group would be assigned to SAC at the conclusion of Korean hostilities, FEAF attempted no permanent reorganization of the Bomber Command. Instead it remained a provisional headquarters, with its key officers being furnished in rotation by SAC. Bomber Command continued to possess operational control over the 19th Group and SAC's 98th and 307th Bombardment Groups (M), while to provide an important part of its reconnaissance, it had operational control over the 91st Strategic Reconnaissance Squadron, Photo, this being the redesignation given the 31st Strategic Reconnaissance Squadron on 16 November 1950.[50]

Headquarters of FEAF Bomber Command, the 98th Group, and the 91st Squadron occupied Yokota Air Base on Honshu as tenants of Fifth Air Force and later of the 314th Air Division, organizations which also furnished administrative and logistical support. On Okinawa at Kadena AFB, the Twentieth Air Force supported the Advance Echelon, FEAF

*See Chap. VIII, pp 243–44.

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Bomber Command and the 19th and 307th Bombardment Groups. The two SAC groups were redesignated with wing status in February 1951, becoming the 98th Bombardment Wing (Advon) and the 307th Bombardment Wing (Combat Echelon). On 12 September 1951 the Advance Echelon, FEAF Bomber Command was inactivated, with the 307th Wing assuming its operational duties.[51]

Changes in Key Air Commanders: The passage of time brought changes in the principal FEAF commanders. Following a sudden heart attack, General Stratemeyer on 21 May 1951 yielded command of FEAF to Lt. Gen. Earle E. Partridge, commander of the Fifth Air Force and next ranking air officer in the Far East. General Partridge was already slated for rotation to take command of the USAF Air Research and Development Command, and on 10 June 1951 Lt. Gen. Otto P. Weyland* took command of FEAF. In World War II, General Weyland had been outstanding in the field of tactical air warfare and had commanded the XIX Tactical Air Command in Europe. After 4 May 1950 he had been commanding general of the USAF Tactical Air Command, but on 20 July 1950 he had been sent to FEAF on temporary duty as vice commander for operations.[52]

When General Partridge moved to FEAF, Maj. Gen. Edward J. Timberlake assumed command of the Fifth Air Force until 1 June 1951, when the USAF-designated commander, Maj. Gen. Frank F. Everest* arrived in the Far East. On 1 June 1951, Brig. Gen. James Ferguson became Fifth Air Force vice commander, relieving General Timberlake who subsequently assumed command of the Ninth Air Force in the United States.[53] General Ferguson was succeeded on 12 January 1952 by Brig. Gen. Dudley D. Hale, and on 30 May 1952, following a new pattern of rotation, Maj. Gen. Glenn O. Barcus* succeeded General Everest as Fifth Air Force commander.[54]

SAC provided commanders for the FEAF Bomber Command in rotation: Maj. Gen. Emmett O'Donnell, Jr., who had established and given initial direction to the command, was relieved by Brig. Gen. James E. Briggs on 10 January 1951 and thereafter the commanders were Brig. Gen. Robert H. Terrill (23 May 1951), Brig. Gen. Joe W. Kelly (30 September 1951), and Brig. Gen. Wiley D. Ganey (15 March 1952). Following two years in command of the Philippines Command (Air Force) and Thirteenth Air Force, Maj. Gen Howard M. Turner was relieved by Brig. Gen. Ernest Moore on 16 October 1951.[55] Maj. Gen. Ralph F. Stearley continued in command of the Twentieth Air Force. On 10 June 1952 Brig. Gen. Paul E. Ruestow replaced Brig. Gen. John P. Doyle in command of the Far East Air Materiel Command.[56] The commanders of the 314th and 315th Air Divisions have previously been noted

*By USAF policy the commander Fifth Air Force received temporary rank as lieutenant general General Everest was so promoted on 20 Dec 1951 and General Barcus on 10 June 1952 General Weyland was promoted to general on 5 July 1952

AUGMENTATION OF FEAF FOR "LONG-HAUL" HOSTILITIES

FEAF Confronts the Problem of Extended Conflict: "One of my major failings . . . has been to take a look at the chips I have and say, how can I best accomplish my mission with what I have?" commented General Partridge as he looked back at the first year of Korean hostilities "What we should have done," he continued, "was to sit back and scream for more and get what we needed to fight a war and accomplish our mission." As Partridge viewed the situation in May 1951, the Fifth Air Force was "short of everything," and he ordered his staff to get down to business and figure its requirements for another year of war. "There is nothing to point to the fact," he said, "that we won't be here next year." [57]

A month later General Weyland urged USAF to augment the minimum FEAF forces, equipped below authorized levels, which had contributed so mightily to the initial year of Korean operations. "To accept the theory,"

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he warned, "which envisages the current United Nations military position in Korea as . . . a stalemate is to completely ignore the innumerable advantages of air power as a predominant weapon for destroying the enemy fighting machine and to acquiesce to the dangerous 'rule of thumb' whereby military success, regardless of cost, is measured solely in terms of geographical gain." Weyland suggested that USAF ought to "plan for a 'long haul' and program accordingly." [58]

With a few important exceptions USAF and FEAF had supported the initial year of Korean hostilities from stored stocks of equipment left over from World War II. For the most part this expedient was necessary because the USAF with approximately 40 groups total strength in 1950 was what General Vandenberg called "a shoe-string Air Force." [59] With a total inventory of less than 2,500 jet aircraft of all types, USAF in July 1950 had been unable to provide FEAF with the F–80C aircraft which it desired to use as fighter-bombers; instead FEAF had been required to convert three of its jet fighter wings to F–51D aircraft, these conventional World War II Mustangs being gathered in from the National Guard or taken from storage.[60] Ammunition and bombs, communications and radar equipment, aviation engineer equipment were but a few items which went from supply dumps to the combat zone, often in a less than desirable state of serviceability.

In supporting FEAF, moreover, USAF had to keep in view the world-wide commitments of a "shoe-string Air Force." Since World War II the USAF atomic capability manifested in its Strategic Air Command had been the single factor which permitted the West to maintain a balance of power against the massive land armies of the USSR; the dispatching of four B–29 medium bomber groups to the Far East had been at the expense of this atomic capability. Allocation of additional fighter-interceptor and fighter-bomber units to FEAF was at the expense of unmet North Atlantic Treaty Organization commitments, the air defense of the United States, and the fighter-escort capability of SAC.[61]

From the outset of Korean hostilities General Vandenberg had nevertheless accorded FEAF strong support: "We want to . . insure the position of the USAF in this job that is being done over there, be sure that it is being done with the very best equipment and in the shortest time," he ordered. "When the request comes in, that request must be fully met." [62] In June 1951—the same month in which General Weyland called for "long-haul" programs—USAF pointed out that the current deployment to FEAF was already greater than the JCS allocation of air strength to the Far East and equal to the proposed deployment under the projected expansion of USAF to a 140-combat-wing program.[63] And, concerning programing, General Twining observed that the "short haul dates [for the expected termination of Korean hostilities] being used are for Air Staff planning purposes only; the immediate goal being the acquisition and training of the necessary personnel and the procurement of equipment to complete the program currently authorized by Congress." [64] In short, USAF could correctly maintain at the end of 1951 that: "The Korean war has had first priority in every respect and has been equipped to our poor best at the expense of SAC, the Air Defense of the United States, and our overseas deployment program" [65]

Medium Bomber Problems: At the end of October 1950, when no more suitable targets were available and it appeared that the North Koreans were beaten, General MacArthur had agreed to release the 22d and 92d Bombardment Groups for return to the United States The return of these two groups to the United States was quite important to SAC, which was able to utilize the experienced crews as the nuclei for other new groups which were being activated.[66] When these two groups had gone, three medium bomber groups remained in the Far East. Facing the Chinese Communist armies, General MacArthur on 5 December 1950 requested the JCS to send two more B–29 groups to the Far East; and to meet the threat of enemy air attack against the Japanese bases upon which these groups would be located, MacArthur wanted three additional fighter-interceptor

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groups.[67] The unavailability of the desired fighter-interceptor groups in effect immediately negated the first part of the MacArthur proposition: the JCS quickly replied that all-weather fighter groups were not available, and, rather than hazard two additional medium bomber groups to an all-out Communist air assault, Generals MacArthur and Stratemeyer then requested that the two groups be held on alert in the ZI for dispatch to Guam at the beginning of any general hostilities with the USSR or China, a request in which the JCS concurred on 14 December 1950.[68]

From the view of USAF and SAC the retention by FEAF of even three B–29 groups in the Far East was of doubtful wisdom: In March 1951 a shortage of targets judged suitable for medium bomber attack in Korea led USAF to query General Stratemeyer regarding the advisability of retaining the 98th and 307th Bombardment Groups in the Far East; Stratemeyer replied that CINCFE had directed him to develop area-bombing techniques to utilize the B–29's in close support of friendly ground troops, and, although the USAF Directorate of Operations doubted the feasibility of such employment, the two groups were retained in the Far East.[69] The dissatisfaction of USAF with FEAF's employment of the medium bombers was again manifest in April 1952 when General Stratemeyer, alarmed by the B–29 losses in the Yalu bridge attacks, requested that the two SAC groups in FEAF be kept at 33 aircraft per group, with SAC being prepared to dispatch on short notice up to 10 B–29 replacements. Before making his decision in this matter, General Vandenberg considered the FEAF commitments as opposed to SAC's necessary expansion of combat units, the lead time in rehabilitating B–29's from storage and the training of new crews, and FEAF's utilization of its medium bomber force. The latter consideration led General Vandenberg to caution that FEAF's current use of medium bombers in small flights against many small targets was at best an expensive and arduous method of achieving small results. He believed that less frequent flights of greater numbers—or at least the concentration of the FEAF bombing effort in selected areas—and the coordination of these attacks with fighter-bomber neutralization of antiaircraft positions would offer better protection to the crews and airplanes and achieve more positive results.[70]

Viewed in terms of USAF global responsibilities the maximum medium bomber support which USAF could manage was to maintain the FEAF Bomber Command at a strength of 99 aircraft (30 unit equipment, plus 3 command support planes per group) counting aircraft out of commission but repairable in the theater, pipeline factors, and specialized types such as tarzon-modified bombers USAF stated that attrition rates would be figured for medium bombers on the basis of a 12-sortie daily average operational rate for the FEAF Bomber Command, with an estimated replacement flow of 3 aircraft and crews per month.[71] The USAF decision meant that FEAF would have to husband its B–29 resources, but during the Kaesong truce talks B–29 sorties were sustained at 16 per day to show that Bomber Command had not lost interest in the war.[72]

Critical Night Intruder Deficiencies:* To FEAF its light bomber situation and the USAF light bomber program were of more operational significance than were the medium bombers, because the B–26's represented FEAF's entire night intruder potential. Before the outbreak of conflict in Korea the USAF had possessed no weapons system for detecting and destroying enemy mobile night traffic; furthermore, there was no aircraft which met all requirements for night interdiction operations. The immediate solution in Korea had been to utilize the 3d Bombardment Group's B–26's, but FEAF recognized that these planes lacked a real ability to operate effectively under all-weather conditions or to survive determined hostile air opposition. In the spring of 1951 a USAF board of senior officers selected the British Canberra (B–57) jet bomber as a proposed replacement for the B–26 in night intrusion,[73] but until these aircraft could be produced in quantity, the USAF

*This section follows the FEAF assumption that an additional number of B–26 night intruders would have benefited its night intruder effort, for a better-balanced contrary viewpoint *see* Chap. VI, pp 176–78

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remained committed to a B–26 program which was replete with configuration changes, parts shortages, and modification difficulties. Additionally complicating the B–26 program was the lack of a single B–26 group in the United States to support overseas requirements for crews, but late in 1950 the Tactical Air Command opened a B–26 combat crew training school at Langley AFB, Virginia, with a short curriculum designed to furnish a limited number of replacement crews to FEAF.[74]

The FEAF light bomber strength remained limited. With the arrival of the 452d Bombardment Wing in the theater, FEAF had six squadrons of B–26's, equally divided by squadrons between the 3d and 452d Wings (one of the latter wing's squadrons—the 731st Light-Night Attack—was attached to the two-squadron 3d Wing).* The two 3d Wing squadrons were authorized a war strength of 24 B–26's each, and on 3 February 1951 General Stratemeyer asked USAF to increase the squadron authorization of unit equipment aircraft in the 452d Wing from 16 to 24.[75] USAF then considered it inadvisable to authorize an increase in the FEAF light bomber allocation because of an insufficient CCTS output of B–26 crews, but effective in May the input of the Langley CCTS was expanded from 12 to 45 crews per month, which would provide an anticipated 42 crews per month beginning in July.[76] On 14 April 1951, General Stratemeyer, now intending to commit the 452d Wing to night operations, renewed his request for additional authorization of B–26's; he needed six light bomber squadrons with 144 unit aircraft plus 72 for theater reserve, or a total of 216 B–26's.[77] Increased monthly attrition rates, moreover, necessitated still more B–26's; basing his request on a monthly attrition of 11 B–26's, Stratemeyer told USAF in May 1951 that he would require some 55 additional light bombers above those currently scheduled to maintain an authorized strength of 144 through December 1951.[78] In his letter of 10 June 1951 requesting "long-haul" programing, General Weyland asked that FEAF's two light bomber wings be brought up to war strength.[79] In mid-September 1951, General Weyland invited USAF attention to the large B–26 night intruder claims against Korean road traffic and indicated that more B–26's would more effectively choke off the flow of enemy supplies.[80]

Despite these insistent and urgent requests, USAF met much difficulty in securing additional B–26 aircraft for FEAF. Some part of the trouble lay in commitments to Europe because the August and September 1951 output of modified B–26's was committed to the 126th Wing, which TAC was readying for deployment to Europe.[81] Determined not to let the matter rest as long as he so badly needed night interdiction effort, General Weyland even proposed to take the 126th Wing; when the Korean situation improved, he would release it to USAFE "fully trained and in combat trim."[82]

The principal drag in the B–26 program, however, was in the modification of the long-out-of-production aircraft to a configuration desired by the Fifth Air Force, a process which was additionally complicated by changing night intruder tactics in Korea. Early in the war the USAF was put in an awkward position when it spent $4,000,000 to effect a desired configuration change which the Fifth Air Force, some 11 months later, decided was unnecessary.[83] As requirements stood in the summer of 1951 the Fifth Air Force wanted some 30 modifications or equipment installations made on its night intruders, all of which took time to accomplish and many of which called for equipment in short supply. Finally in October 1951, USAF hit upon an emergency solution to the FEAF B–26 requirement: by cannibalization of some B–26's being used for command liaison and training flights in the ZI, the modification rate could be slightly increased, provided FEAF was willing to accept B–26's which did not entirely meet the desired intruder specification: the planes would lack shoran, have package guns instead of the desired internal wing guns, and would have dual SCR–522 radio sets instead of the desired AN/ARC–3 radio. The proposition was agreeable to FEAF, and, with shipment of non-

*The 731st Bomb. Sq. (L–NA) was inactivated effective 25 June 1951, concurrently the 90th Bomb Sq (L) was activated and assigned to the 3d Bomb Wg (L)

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standard intruder B–26's and cannibalization permitted for the parts build-up, General Vandenberg on 27 October 1951 directed that immediate action be taken to increase the unit equipment of FEAF's two B–26 wings to 144 aircraft, plus 50 per cent combat reserve.[84]

Not even this emergency action was able to build the two Fifth Air Force intruder wings up to a desired unit equipment strength of 24 aircraft per squadron, and in the spring of 1952 a final action allocated 24 B–26's to each of the three squadrons of the 3d Wing while each of the three squadrons of the 452d (later 17th) Wing remained at an authorized strength of 16 aircraft; the total FEAF authorization of B–26's was thus 120 aircraft, plus 60 aircraft in theater reserve.[85] Receipt of a good many non-standard B–26's in the theater during January, February, and March 1952 threw upon depot facilities a severe burden which took some time to work off; some 50 of the B–26's received each required from 3,000 to 5,000 man hours before they could be put into a combat wing. A part of the B–26's received had "flat top" canopies instead of desired "clam shells"; these planes could not be used in combat because a pilot wearing a liferaft and winter flying equipment could not escape from such an aircraft in an emergency.[86] In September 1952, the 3d and 17th Wings finally reached their authorized strength in aircraft,[87] but by this time General Barcus, dissatisfied with the night intruder results permitted by the tactics possible with B–26's, had largely diverted the wings from intrusion.* FEAF's official position now was that "the B–26 is nearly completely inadequate to perform night intruder mission and there is not too much that can be done to develop that airplane to perform in the proper night intruder role." [88]

A parallel and equally unsatisfactory situation existed throughout 1951 and 1952 in the delivery of night intruder combat crews to the Fifth Air Force. Although crews were furnished by USAF, they were not as well trained as was desired, with the result that the two combat intruder wings had to devote one hour out of four flying hours to training their replacements.[89] Fundamentally, the difficulty lay in the fact that USAF had no ZI B–26 units upon which to levy for replacement crews Lacking necessary bombing and gunnery ranges and geared to produce 42 crews every 5 weeks without much possibility of expansion, the Langley CCTS could not fill FEAF's attrition and rotation requirements which went from 58 crews a month, to 63 a month, and then to 93 a month in the last half of 1951. The difference between the CCTS output and FEAF requirements had to be met by direct levy on the major ZI commands, not for crews but for casual crew personnel who were formed into crew elements for further training in the Far East.[90] The whole result of this system was that the Fifth Air Force, instead of getting the higher qualified individuals and crews necessary for the exacting requirements of night intruder work, received in many cases the men who could be most easily spared by ZI commands.

Fighter Aircraft Developments: Continuation of the Korean conflict beyond expectations, the ominous build-up of Communist jet-equipped air forces in Manchuria, and increased Red antiaircraft and interception firepower compelled a reexamination of the FEAF fighter complement in the spring of 1951. USAF had provided F–51's at the outset of the Korean hostilities in the expectation that they would be capable of meeting enemy opposition, could best operate from rough Korean airfields, and especially because they were available in considerable numbers. But coincident with the Communist spring offensive of 1951, Red small-arms fire and light and heavy flak increased tremendously along the main enemy supply routes, at key bridges, and around hostile supply areas and airdromes. During the 33 days prior to 4 May 1951, for example, the Fifth Air Force lost to enemy ground fire 25 F–51's, 13 F–80's, and 2 F–84's. With its vulnerable engine and coolant system, the F–51 loss rate per sortie to hostile ground fire was just under 100 per cent greater than the F–80 loss rate and almost 6 times greater than the F–84 rate General Stratemeyer was so bothered by his

**See* Chap VI, pp. 173–76.

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F–51 losses that he queried General Twining as to the practicability of getting the more-rugged World War II F–47 type fighters as replacements for the Mustangs.[91] USAF was unwilling to complicate logistics by the introduction of a second obsolescent conventional aircraft into Korea, and General Vandenberg suggested that the only possible solution lay in replacing the F–51's with jet types, a solution which was going to be forced by declining USAF stocks of Mustangs. An immediate fix might be to move the F–51's back to the defense of Japan where their attrition rates would be more acceptable.[92]

Partial compliance with General Vandenberg's suggestion came on 25 May 1951 when the Fifth Air Force transferred the 35th Fighter-Interceptor Wing to Johnson Air Base in Japan for use as the 314th Air Division's defense operations center; the 40th Squadron of the wing went to Misawa for conversion to F–94 interceptors, while the 39th Squadron remained a Mustang unit and was attached to the 18th Fighter-Bomber Wing. These changes took one F–51 squadron out of action, and its planes were divided among using squadrons remaining in Korea.[93] Effective in July 1951 the RAAF 77 Squadron was converted from Mustangs to Meteor–8 jets.[94] Declining stocks of F–51's forced USAF to lower theater reserves of this type aircraft to 10 per cent, but General Weyland, for the time being, was unwilling to take his remaining Mustangs out of action, explaining that Korean airfield construction was lagging and that he could not permit the removal of such a substantial proportion of his combat potential as was represented by the Mustangs.[95] On 19 April 1952, however, the 39th Fighter-Interceptor Squadron was transferred from the 18th to the 51st Wing for conversion from Mustangs to Sabres.[96]

Replacement support for FEAF F–80 groups encountered some of the same difficulties as were met by the Mustang units, for this earliest of USAF jet fighters was no longer being produced. In April 1951 the Fifth Air Force figured its F–80 attrition rate at 18.3 planes each month and reckoned that its F–80 groups would be reduced to unit equipment strength by 1 July 1951; if F–80 operations were going to continue on the usual scale, one group of these planes would soon have to be converted to F–84's, the plane which USAF had designated as the F–80 replacement.[97] At just this time the Fifth Air Force was about to lose the 27th Fighter-Escort Wing, which had demonstrated that its F–84E's were an excellent fighter-bomber replacement. This wing represented the only escort fighter experience available to SAC, and on 6 April 1951 General Curtis E. LeMay, SAC commander, obtained General Vandenberg's agreement that the 27th Wing would be returned to the United States. Rather than deprive the Korean war effort, USAF decided that the 27th Wing would leave its planes and equipment in the theater and that it would be replaced by the 136th Fighter-Bomber Wing, an Air National Guard unit mobilized in October 1950.[98] According to plan, personnel of the 136th Wing replaced that of the 27th between 1 June and 1 August 1951; each tactical squadron of the 136th received a period of tutelage from the 27th Wing squadron.[99] Late in May 1951 the Fifth Air Force also charged the 27th Wing with giving transition training to personnel of the 49th Fighter-Bomber Wing, which began shortly afterward to trade its F–80C aircraft for F–84E's. At the end of August 1951 all three squadrons of the 49th Group had completed conversion to the Thunderjet fighters, and personnel of the 27th Wing returned to the United States.[100]

During the summer of 1951 the same impressive Communist air strength build-up which caused FEAF to intensify the 314th Air Division's preparations for Japan air defense prompted General Weyland to request an early assignment of two additional fighter wings to the Japanese air garrison, wings which could also fulfill the USAF responsibility for providing air-ground training with the XVI Corps, comprising the two partly trained National Guard divisions being held in reserve in Japan.[101] Only one suitable wing was available, the 116th Fighter-Bomber Wing which had been mobilized in October 1950, and it was under orders to go to USAFE. On 1 July 1951 most of the wing's F–84E air-

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craft had already gone to the New York POE, but on 3 July USAF ordered the 116th to FEAF, with substitute aircraft being furnished by other commands. In view of the corrosion difficulties involved in surface transport the previous December, all of the 116th Wing's planes were provided a heavy coating of cosmoline at Alameda, whence they were shipped aboard two escort carriers on 10 and 12 July. Although the planes were inspected daily and the protective coating renewed when necessary, 33 of the 75 aircraft suffered either structural damage or corrosion during the ocean voyage. Arriving in Japan on 24 July 1951, the 116th Wing took station at Misawa with two of its squadrons, while the third squadron settled at Chitose Air Base.[102]

As the peace talks dragged on and the Red air forces waxed in strength, General Weyland became increasingly apprehensive about air superiority. If the war continued, he reasoned on 12 July 1951, the success of the UN campaign would be determined by a struggle between the Chinese air forces and FEAF; thus far the Korean war had demonstrated that air superiority was the key to military success regardless of the numerical strength of opposing surface forces, and FEAF had to retain a capability to absorb initial Chinese air attacks and to launch immediately effective counterattacks An armistice, if achieved, would be effective only as long as FEAF retained the capability of achieving air superiority. "Unless our relative air strength . . . is maintained equal or better than the CCAF," Weyland informed USAF, "I feel that our expenditures of men and money in the Korean war may well have been in vain " [103] To retain air superiority, FEAF required additional fighters, of which the F–86 was the best existing type for the purpose. Sending additional fighters to the Far East, however, would denude the air defenses of the United States, and General Vandenberg's initial reaction was that a second F–86 wing could not be sent to FEAF. In mid-September 1951, although General Weyland again urgently requested F–86's, USAF continued to assert that its "capability of supporting one F–86 unit in FEAF is questionable and the ability to support two does not exist." [104]

While USAF was finding itself unable to provide FEAF with Sabre reinforcements, the CCAF was fairing better from its Soviet source of supplies: FEAF estimates of Chinese air strength rose from 1,050 planes on 10 June 1951 to 1,255 on 1 September 1951, the additional aircraft being MIG–15's and bringing the total of these jets up to 525.[105] On 26 September, General Weyland cabled USAF. "I consider the present F–86 force inadequate for the future and recommend serious consideration be given to the immediate dispatch of another F–86 wing to this theater." Medium bomber attacks into northwest Korea had become impracticable, fighter-bombers were having to jettison their bombs to fight off MIG interceptors, and, unless checked, there was very real danger that the enemy would establish air bases in North Korea and threaten UN air superiority over the battle lines If USAF could not furnish another Sabre wing, Weyland suggested that one of FEAF's F–80 wings could be converted to F–86's.[106] The threat was now so grave that USAF could no longer countenance it: at the moment the Air Defense Command had only 81 F–86E's, but on 22 October 1951 General Vandenberg ordered 75 of them, together with 75 pilots and 75 crew chiefs, flown to Alameda for expedited movement to Yokosuka For its part, FEAF agreed to return an equivalent number of F–80 pilots and crew chiefs, but it was permitted to retain the released F–80C's as theater reserve and as attrition replacements for its remaining F–80C group.[107]

Informed that the Sabres were en route to Japan, FEAF made plans to convert three of its F–80 squadrons. General Everest, however, wanted to equip the two-squadron 51st Fighter-Interceptor Wing with the Sabres, reasoning that the wing was already scheduled to convert to F–86D's in 1953, whereas the three-squadron 8th Wing was slated to receive F–84's. FEAF perceived some wisdom in the plan and had the additional reasoning that the limited number of F–86's and F–86 mechanics which it was getting would make it much easier to support a total of five Sabre

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squadrons rather than the six contemplated by USAF.[108] This proposition nevertheless met some objection in USAF, where the opinion was that as many F–80 squadrons as possible should be reequipped; but at a commanders' conference in Japan late in October 1951, General Vandenberg approved the conversion of the two squadrons of the 51st Wing.[109] The 75 Sabres left Alameda aboard two escort carriers early in November, greater precautions having been taken to weatherproof them for the Pacific crossing than in earlier shipments.[110] In November 1951 the 51st Wing began conversion and flew its first F–86 combat mission on 1 December; the transition was completed on 21 December 1951.[111] To compensate for the reduction in the fighter-bomber capability, FEAF committed the 116th Fighter-Bomber Group to combat, but because Korean airfields were congested, only one squadron at a time was rotated to Taegu (K–2), the first of them arriving at the Korean airfield on 30 November 1951.[112]

Arrival of these Sabre reinforcements did not allay the FEC apprehension regarding the growing Communist air forces. In December 1951, General Ridgway urged the JCS to consider this serious challenge to UN air superiority. to achieve bare numerical parity with the hostile MIG forces, FEAF required eight F–86 groups Coming at a time that USAF and FEAF were thinking of conversion of squadrons to Sabres with the utmost difficulty, the Ridgway statement was obviously for the record. In February 1952, however, the JCS advised that the USAF had purchased 60 F–86's from Canada, which with other Sabres to become available from U.S. production should enable FEAF to achieve two war-strength F–86 wings, together with 50 per cent theater reserve, by June 1952.[113] To provide the 51st Wing with a third squadron, FEAF therefore effected the transfer of the 39th Fighter-Interceptor Squadron from attachment to the 18th Wing on 1 June 1952, and during that month the squadron began to receive new F–86F aircraft, the first of this model Sabre to reach the Far East.[114] In addition to this reinforcement, the USAF agreed to maintain a SAC fighter wing on rotation in Japan: leaving Turner AFB, Ga., the 31st Fighter-Escort Wing utilized in-flight refueling across the Pacific to reach Japan on 15 July 1952. This pioneer trans-Pacific flight by single-engine jets required 11 days for the wing crossing, but it had been undertaken in fairly easy stages.[115] Not only was FEAF provided with needed F–84G defense aircraft, but the 31st Wing demonstrated the practicability of movement of jet fighters from the United States to Japan in a short time and without the corrosion difficulties of a water voyage.

BUILDING SEMI-PERMANENT KOREAN AIRFIELDS

The Korean Airfield Problem: Chiefly because in the press of combat it lacked the time, manpower, and equipment to do anything else, the Fifth Air Force during the first year of Korean hostilities built temporary airfields in Korea, few of them being expected to last under sustained use for more than six months. Not only did these temporary Korean airfields limit the operational capability of combat aircraft, but they were the cause of costly operational losses not due to enemy action. Poor flight surfaces reduced combat loading of aircraft: thus a FEAF study could conclude that between 1 July 1950 and 28 February 1951 some 29,751 F–80 sorties delivered the same number of rockets which theoretically could have been delivered by 7,650 sorties and that simultaneously 5,049 tons of napalm and bombs could have been dropped whereas only 3,376 tons were dropped. The combination of short and rough runways and inadequate parking areas had resulted in serious damages or destruction to equipment valued at over $10,000,000.[116] In May 1951 General Partridge called a halt to short-sighted construction: "build the best establishments you can," he ordered the Fifth Air Force staff, "and assume you will be staying there."[117]

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Basically the Korean air-facilities problem was not one of short-sighted staff action, but it rather stemmed from two causes: physical geography and extant airfields made the Korean peninsula a poor site for basing an air force, and, of more importance, FEAF lacked adequate engineer aviation troops to exploit even the limited potential there. The predominantly hilly to mountainous Korean peninsula is cut frequently by numerous braided streams which, generally narrow in the uplands, broaden into coastal flats on the south and west coasts Stream valleys and other reasonably flat terrain have been terraced and irrigated for centuries, resulting in a high water table which makes subsurface drainage a major engineering problem. In the interior of central Korea, where the tactical situation demanded forward airfields, sites usually had to be selected under far from ideal circumstances. few of them could meet desired criteria even for limited operations because of crosswinds through mountain valleys, high water tables, poor glide angles, obstructions in the clear zones, and limited areas for parking and future extensions.[118]

During the initial stages of Korean hostilities the Fifth Air Force had used former Japanese airfields which generally occupied the most acceptable sites, but these old facilities had been built for lighter planes, and their sod or light coatings of asphalt or concrete rapidly went to pieces under heavy wheel loadings.* In the press of combat, aviation engineers had covered the old runways with pierced steel plank (PSP), frequently with little consideration for subgrade conditions. Had traffic upon these temporarily surfaced runways been limited to conventional fighters, it is probable that they would have served their purpose, or it is possible that they might have survived had they been used only by jet fighters, but a combination of jet blast and pounding by heavily-loaded transport planes rapidly deteriorated the base courses At Taegu (K–2) a PSP surfacing had been laid on dirt; and during extremely heavy traffic jet blasts eroded the soil beneath the planking; heavily loaded cargo planes forced the PSP into these depressions; the runway became so rough that flight safety research personnel, taking off in a lightly loaded C–45, experienced nine false take-offs before they could keep their plane in the air Impact loads when F–80's took off were so great that transient structural deformations were visible to the naked eye.[119] Under continued use the PSP rolled and buckled, clips worked loose and lacerated aircraft tires, while the perforated surface slowed the planes and increased the take-off roll.[120] Ridges and sharp projections snagged tip and napalm tanks.[121]

Limited rehabilitation of the old Japanese facilities was the most which could be managed with the small amount of engineer aviation effort initially available in Korea. Between July and September 1950, FEAF had moved the 930th Engineer Aviation Group with the 822d and the 811th Engineer Aviation Battalions to Korea, where, as has been told elsewhere,* they ran into a myriad of problems arising from manning difficulties (engineer personnel was furnished by the Army), lack of peace time training (the 822d's prime responsibility had been to operate a rock quarry on Okinawa and the 811th was "totally untrained"),[122] and worn-out earth-moving equipment. "Too little engineering and too many 'eye ball' engineering principles were used primarily because the officers and noncoms had not been trained in aircraft characteristics, loads, base requirements, importance of drainage, etc." reported the Fifth Air Force director of installations in January 1951.[123] As late as August 1951 a USAF consultant found that the aviation engineers in Korea still did not understand soil compaction, subsurface drainage, and asphaltic surfacing.[124]

Build-up of Korean Engineer Aviation Forces: Aviation engineer difficulties manifest in Korea during the first year of the war led to the establishment of an Engineer Aviation Force under the USAF Continental Air Command on 10 April 1951,[125] but its effect would

*See AHS–71, pp 16, 62–73.

*See AHS–71, pp 18–19.

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be long-range. Meanwhile, FEAF required more aviation engineer troops in Korea. On 6 March 1951, General Stratemeyer sent USAF a requirement for five additional engineer aviation battalions, three engineer maintenance companies, one engineer petroleum-distribution company, one engineer dump-truck company, and two engineer parts-supply platoons. Stratemeyer noted that Korean experience demanded that engineer aviation battalions be used as integral units rather than as separate companies and that the complexities of refueling jet aircraft in short periods of time required an engineer POL company to install and maintain adequate refueling systems. None of these units were available to USAF, which instead advised General Stratemeyer to concentrate all available FEAF aviation engineer troop strength in Korea and to convert rear area construction from troop effort to a private construction contract.[126] Such action was taken on Okinawa, and in April and May 1951 FEAF transferred the 931st Engineer Aviation Group, the 802d, 803th, and 839th Engineer Aviation Battalions, and the 919th Engineer Aviation Maintenance Company to Korea.[127]

Although every engineer aviation organization assigned to FEAF was concentrated in Korea, the Fifth Air Force indicated that it still needed three additional full-strength engineer aviation battalions in order to carry out its own base-construction program and to meet Eighth Army requirements for forward resupply airfields.[128] On 12 July 1951 General Weyland informed USAF that five battalions were needed in addition to the five battalions already in Korea.[129] For the time being, the best that USAF could do was to commit two engineer aviation battalions and an engineer aviation maintenance company to FEAF at such time as they could be trained and equipped, but General Vandenberg pointed out that recent augmentation of battalion strengths of 997 men had already given FEAF, counting these additional units, a force equivalent to nine old war-strength battalions.[130] In the fall of 1951 by stripping other ZI units of critical items of equipment and obtaining limited amounts of new equipment from current production,[131] the Engineer Aviation Force sent the 622d Engineer Aviation Maintenance Company and the 809th Engineer Aviation Battalion to Korea in September, while the 1903d Battalion followed in November.[132]

While briefing General Vandenberg on 10 November 1951, FEAF representatives asked for still other engineer troops, including five engineer aviation battalions in addition to the seven currently assigned. The two battalions not previously requested were desired as theater reserve, with one to be based on Okinawa and the other on Japan.[133] To control this augmented force, FEAF also required an engineer aviation brigade headquarters and another engineer aviation group headquarters.[134] These requests for headquarters troops and additional battalions were quickly approved by USAF, which assigned S–1 supply priorities to the 366th, 840th, 841st, 843d, and 866th Engineer Aviation Battalions.[135] In May and June 1952 the 417th Engineer Aviation Brigade, 934th Engineer Aviation Group, and the 366th, 840th, and 841st Engineer Aviation Battalions arrived in Korea.[136] Although FEAF furnished elaborate justification for the assignment to it of an engineer petroleum-distribution company and two dump-truck companies, USAF discerned that these units were chiefly necessary because the regular engineer aviation battalions were short of their authorized equipment (the 809th Battalion reached Korea without organizational dump-trucks). Instead of committing additional units, USAF preferred to reprogram the existing engineer structure to provide an integral capability of truck transportation and POL-facilities construction.[137]

By June 1952—two years after initiation of hostilities—the Fifth Air Force at last possessed the engineer aviation capability which it required in Korea: 10 aviation engineer battalions. Not only was the working capability now greatly expanded, but the 417th Brigade, attached to Fifth Air Force on 17 May 1952,[138] met a long-standing need for an agency which could adequately supervise Korean air facil-

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ity construction, an activity which had proved beyond the capability of the small staff of detached service personnel available to the I Construction Command (P) prior to its deactivation on 1 December 1950 and to the Fifth Air Force directorate of installations after that time. The Fifth Air Force charged the 417th Brigade with the command of all engineer aviation units in Korea, with supervision and performance of construction as directed, and with the conduct of continuous training and maintenance of personnel proficiency.[139]

Construction of Korean Air Facilities: But to return to the spring of 1951 and the status of the construction program in Korea, any augmentation of engineer troops was in the far distant future, and the Fifth Air Force was struggling to keep its remaining airfields in South Korea open for operations. In the first quarter of 1951 the 811th and 822d Engineer Aviation Battalions worked at a number of company projects designed to maintain and give limited improvements at the Pusan airfields (K–1 and K–9), Taegu (K–2), and Chinhae (K–10). Company C of the 811th opened a strip for the Mosquito squadron south of Taegu (K–37) on 2 January 1951, and completion of a new PSP runway at Pusan (K–1) enabled the 1st Marine Air Wing to begin operations there on 9 February. When the Chinhae sod runway deteriorated under 18th Wing Mustang operations, Company A of the 811th regraded and resurfaced it, beginning on 26 March and completing work on 25 April.[140] Although it was by no means certain that UN troops would continue to hold Taegu (engineer troops were ordered to evacuate on 12 January 1951 but the order was rescinded), the 822d Battalion labored to keep the two PSP runways at K–2 in passable maintenance. Thus, Company A replaced 22,000 square feet of PSP in January and 44,972 square feet in February, using Korean hand labor since all heavy machinery had been evacuated to Pusan. After completing its assigned tasks at Pusan (K–1), the remainder of the 822d Battalion concentrated in March at Taegu where rains, wet ground, and equipment breakdowns delayed efforts to lengthen the two runways. As has been noted,* the combination of heavy air traffic and subsurface deficiencies at K–2 made the runways so hazardous by mid-May 1951 that extensive renovation was imperative. On 17 May the northernmost runway was accordingly closed, the PSP removed, and work was begun on a new foundation. During reconstruction this runway was extended to 8,100 feet, primed with asphalt, and resurfaced with PSP; this construction project was completed on 22 June 1951.[141]

Meanwhile, limited surface communications routes were rendered even more tenuous by spring rains, and the advancing UN ground campaign in central Korea demanded forward airstrips for cargo airlift. On 19 April, Company C, 811th Battalion, began a 4-day, 400-mile motor march to Chunchon, arriving just in time to be forced to retreat to Hoengsong, where construction was undertaken on K–46 airfield. Early in May, when the Communists appeared about to enter Hoengsong, the company sent a detachment back to grade a short strip at Chungju (K–41). Only 3,200 feet long and surfaced with river run gravel, without any form of compaction, this strip nevertheless held up under cargo planes, 117 of them landing on 20 May with 600 tons of ammunition and supplies.[142] In June the company returned a part of its effort to Chunchon (K–47), and the following month the 811th Battalion (less Company B which remained behind until September to complete K–1 airfield) moved to K–46. There and at K–47 the battalion completed asphalt-surfaced strips suitable for Mustang and C–119 operations on 30 September 1951; this task was much retarded by heavy rainfall in the period of construction activity.[143]

Until April and May 1951, when the arrival of the 931st Engineer Aviation Group and the 802d, 808th, and 839th Battalions built up its construction strength, the Fifth Air Force was able to do no more than prepare minimum air facilities. The additional units permitted an expanded program looking toward the preparation of semi-permanent facilities, with a life

**See* Chap. II, p 64

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expectancy under sustained operations of as much as two years. In May the 931st Group was assigned the task of constructing a 5,000-foot runway, taxiways, and parking aprons at Kunsan (K–8), the repair of Kimpo (K–14), and the extension of the 5,700-foot runway at Suwon (K–13) to 7,000 feet, as well as the construction of a parallel taxiway and parking apron there.[144] On 4 July 1951, General Everest further directed that 9,000-foot runways would be built at Taegu (K–2), Kunsan (K–8), and Suwon (K–13).[145] Taegu was the responsibility of the 930th Engineer Aviation Group, but the 931st assigned the Suwon project to the 802d Battalion, the Kunsan construction to the 808th, and the repair work at Kimpo to the 839th. As the battalions went to work, rain greatly hampered all three projects. Conditions were especially bad at Suwon where the subsoil was a spongy mass and both air and ground traffic was heavy. At Kimpo the bomb craters caught water which had to be dried up after each storm.[146]

Benefited by a spell of unseasonably dry June weather, the 802d spurted ahead at Suwon, completing a priority PSP extension at the south end of the runway on 23 June. A warm-up apron was finished on 8 July, and by the end of the month a parking ramp for two squadrons of F–86's was in use. As of 31 July the Suwon runway had been extended to 6,700 feet, but plans for the 9,000-foot length entailed removal of a Korean village, and the runway did not reach its maximum permitted length of 9,068 feet until 23 December 1951.[147] The resultant strip clearly showed its polygenous construction: 5,118 feet were Japanese-built 2.5-inch concrete over a prepared base; the extension to 6,568 feet was selected fill, asphalt treated, with PSP surface; the extension to 9,068 feet was selected fill with a 2-inch macadam surface.[148] As the extension was completed, the old concrete surfacing was already breaking up; so the 802d began resurfacing it with two inches of hot-mix asphalt on 25 January 1952, working on half the runway while the other half remained in operation. Rain, cold, sleet, and snow combined with breakdowns in the asphalt to delay this work, so that it was not nearing completion until June 1952.[149]

Of all Korean air facilities existing before the war, Kimpo's 6,200-foot and 3,710-foot asphalt-surfaced runways most closely approached U.S. standards. Seized shortly after the 15 September 1950 UN landings at Inchon, the airfield had been patched up for air operations, but a large bomb crater near the intersection of the two runways gave much trouble, eventually necessitating the closing of the short runway in November 1950 while the crater was excavated, refilled, and resurfaced.[150] Following the UN withdrawal from the Seoul area, a formation of B–29's had laid a pattern across Kimpo on 9 January 1951, an unfortunate attack, for the airfield would be returned to UN possession within two months. On 17 March 1951 the 8th Air Base Group began the rehabilitation of Kimpo, and by 12 April the air installations officer (AIO) had reopened the short runway for transports. The AIO was making some progress refilling some 42 bomb craters which covered the long runway and west taxiway when the 839th Engineer Aviation Battalion began work on 12 May.[151] While a study of the craters interested operations analysts who were then attempting to determine the most effective ordnance for closing Communist airfields in North Korea,* the engineers, much troubled by excessive rains of April and May which kept the soil thoroughly soaked, at first were at a loss to determine how the craters could be best refilled: they tried filling one crater with sand-bags, but the fill collapsed under the weight of a 10-ton roller, then they used decomposed granite fill, compacted in 2-inch layers up to approximately 14 inches below the pavement line, over which they placed 6- to 8-inch stones, and covered them with a 4-inch layer of penetration asphalt, and finally finished the surface with a 2-inch layer of cold-mix asphalt.[152] The 839th Battalion finally completed filling the craters on 15 June, and the main Kimpo runway was put into full operation on 23 June 1951.[153] Although usable, the rehabilitated facilities were not too satis-

**See* Chap IV, pp 129–31

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factory: the runways were rough (an 8th Group F–80 snagged a wing tank on 14 August) and the main strip had no overruns.[154] One company of the 839th consequently had to remain at Kimpo to build such short overruns as could be managed in the restricted area and to provide constant maintenance, the latter becoming especially urgent with the spring thaws of 1952. In June 1952 the 811th Battalion was putting together an asphalt plant preparatory to resurfacing the Kimpo runways.[155]

Construction of Kunsan airfield (K–8), where a 9,000-foot runway for light bombers had to be built just inland from the mud-flats bordering the Yellow Sea, encountered Korean drainage problems at their worst. The site had a clay soil, made grayish-blue from long rice culture inundation. The first task of the 808th Engineer Aviation Battalion as it began work on 4 May 1951 was necessarily an extensive system of drainage ditches, but the water table remained high four months later because of pocket-like formations in the non-pervious clay. A first priority 5,000-foot asphalt runway was completed in mid-July 1951, but thereafter the strip entered increasingly water-bound terrain where up to 10 feet of soil had to be removed and replaced. On 24 September, in an effort to speed completion, the Fifth Air Force committed the newly arrived 809th Battalion to augment the 808th, and the arrangement was found fortuitous since neither battalion possessed full equipment but now generally complemented the other. At the end of October 1951 the runway was 6,000 feet long, with a 1,000-foot gravel overrun, but the arrival of cold weather prevented in-place asphaltic surfacing and a hot-mix plant could not be obtained. Grading and compacting of the remaining portion of the 9,000-foot length was completed on 18 December 1951, and, with spring weather permitting, the entire runway was completed on 15 April 1952.[156] For three days the runway was operational, but by 18 April some 6,000 feet had deteriorated into a mass of bumps, ruts, mud holes, and broken surfacing, and only the newest 3,000 feet at the eastern extremity remained usable. The causes of rapid deterioration were primarily a lack of surface and subsurface drainage combined with a springtime capillary action underneath the surfacing, but contributing causes were the porosity of the asphalt surface, some of which had been laid in subfreezing weather, and the poor grade of construction at certain stages due to a lack of equipment and spare parts.[157] Nothing could be done but to close the strip to B–26's while the affected areas were cut out, French drains installed, and the surfacing replaced with 2-inch hot-mix asphalt. Working 24 hours a day, the 808th Battalion completed this project in 22 actual days of work and Kunsan airfield was reopened for flying on 18 May 1952.[158]

The decision to provide Taegu airfield (K–2) with a 9,000-foot runway came shortly after the 822d Engineer Aviation Battalion completed rehabilitation of runway 31R on 22 June 1951. The battalion therefore immediately shifted its work to the adjacent runway 31L, where earth moving on an extension was already underway. By 12 October the earth work was completed to 9,000 feet, and by December runway 31L had 8,000 feet of road-mix asphalt surfacing. In January 1952, despite such obstacles as freezing weather, a 1,000-foot concrete touch-down pad was poured at the northwest end. As this work was nearing completion, however, some 2,000 feet of asphalt adjacent to the concrete went bad, and this stretch was replaced with clay-cement-mix by March 1952. Runway 31L was officially opened on 10 April 1952, and after a nine-day observation period to determine if it would stand up under the heavy traffic, the 822d Engineers launched a round-the-clock repair of the PSP on runway 31R, which was badly deteriorated. In 10 days of intensive work the PSP was removed, the base recompacted, and the steel matting relaid. The rehabilitation of 31R was completed as scheduled on 29 April; but while it was under way, the soil-cement and asphalt on runway 31L had broken up. Since the surfacing had to be replaced, General Everest ordered it done with concrete, and he directed the 822d Battalion,

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augmented by Company A, 1903d Battalion, and Company B, 840th Battalion, to complete the task in 40 days. Beginning to pour concrete on 9 May, the engineers had one-half of the length of the new runway available for jet fighter take-offs on 10 June, and on 28 June 1952 the entire 9,000-foot concrete runway was opened to all aircraft.[159]

While work was progressing on these major airfields, various smaller projects were under way elsewhere. Construction of a 4,500-foot PSP strip at the Seoul municipal airport (K–16) was begun by Company C, 811th Battalion late in September 1951; the 811th Battalion moved there in October; and in November, when weather halted work at Chunchon (K–47), Company A, 811th Battalion joined up at Yongdungpo. The new K–16 runway was completed on 23 November 1951, but drainage and other facilities would require additional effort. Although the main body of the 839th Battalion remained engaged with rehabilitation and maintenance at Kimpo, in July 1951 it sent its Company B to Pyongtaek (K–6) to prepare a base for the Mosquito aircraft of the 6147th Tactical Control Group. By September 1951, when major work was completed, the company had laid down a 4,950-foot PSP runway and in general had given the base a "stateside appearance." [160]

As the 839th closed out its company projects, it was gradually concentrated at Osan, beginning on 15 December 1951 when Company A went there to build access roads on what was to be another major tactical air base with a 9,000-foot runway Regarding the projected surfacing of this facility there was some lingering indecision, the Fifth Air Force first ordering in January 1952 a redesign of the old Japanese runway with flexible pavement; but on 10 April 1952 FEAF approved the use of cement concrete at Osan and at any other facility in Korea where the Fifth Air Force judged necessary. When the 839th had accomplished the preliminary work, the Osan project was raised to an expedited status and the newly arriving 840th and 841st Battalions joined the 839th there in June 1952 These three battalions were to work under the supervision of the 934th Engineer Aviation Group to complete a facility which would serve two F–86 fighter-bomber wings.[161]

Although the runways of the Korean airfields were the critical facilities, dictating the combat load which each aircraft sortie could carry and having much to do with maintenance factors, the aviation engineers had to devote much of their time to other facilities necessary to safe and efficient combat operations. In June 1951, for example, there were no taxiways at Suwon and 4th Wing Sabres had to taxi back on the active runway while other planes were landing, an extremely dangerous situation since hot weather was causing many landing blowouts. Fortunately, there were no crashes between planes out of control and taxiing aircraft, and the aviation engineers soon had a taxiway prepared.[162] That same month at Taegu parking was at such a premium that one row of planes had to be lined up only 150 feet from the active runway, and construction of dispersal stubs required a large amount of engineer effort.[163] Night heckling of Suwon and Kimpo by enemy aircraft demanded the construction of sandbag revetments for fighter aircraft.[164] Troop housing in Korea was at first predominantly winterized tenting, erected either on locally constructed tent frames or their equivalent fabricated in Japan. At Taegu troops were housed in more permanent stucco buildings erected at a not-excessive cost by Korean contractors, but these structures had a short life expectancy and required a considerable maintenance effort. For this reason, numbers of tropical shells manufactured in Japan and steel prefabricated quonsets were extensively used in Korea, both for troop housing and as administrative, medical, and squadron operating facilities Most structures, of whatever nature, were erected by Korean labor or contractors under the supervision of local air installations personnel.[165]

Since a jet wing under combat operations consumed between 75,000 and 125,000 gallons of fuel daily and since it was desirable to maintain a 5-day supply level, the construction of POL tank farms at Korean bases was

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essential, although there was an acute shortage of personnel for such work. Most of the tankage was therefore erected by crews of Koreans working under the supervision of two POL detachments of the 931st Engineer Aviation Group. Pipeline connections to ocean terminals were highly desirable for the jet air bases; such connections were first possible at those airfields nearest to harbor facilities, and in October 1951 a pipeline reached Suwon As late as April 1952, however, fuel consumption at both Kimpo and Suwon outran the pipeline supply and had to be supplemented by rail shipments. The major jet airfield at Taegu remained dependent upon tank-car fuel shipments, although the general disruption of rail traffic during December 1950 and January 1951 had severely curtailed aerial operations at Taegu, demonstrating the essential vulnerability of depending on such methods for transport of jet fuel during times of military crisis.[166]

Providing utilities for the Korean bases was a problem of some magnitude. Water demands at the average base ran to approximately 300,000 gallons per day, and the operations of the 67th Tactical Reconnaissance Wing photographic laboratories at Kimpo (K–14) demanded an almost insatiable supply of water.* While storage tanks and water lines were generally satisfactory, the performance of pumps gave difficulty: many different makes of pump-engines were in use, greatly complicating the stocking of supply parts. Electric power distribution systems in Korea were not dependable, and constant failures of commercial power demanded that each base possess stand-by generators. Like the water pumps, these generators were of many makes and models, requiring a large and varied stock of replacement parts.[167]

Engineer Aviation Personnel and Equipment Difficulties: "The quality and volume of the airfield construction accomplished in Korea," commented a USAF consultant, "in spite of the shortcomings, has been remarkable." [168] These "shortcomings" were chiefly attributable to the personnel and equipment made available to the engineer aviation battalions by the Department of Army. The problem of obtaining enough of the right skills in the form of trained technicians was prevalent throughout the Korean war. The new engineer battalions, like those available in the theater at the outbreak of the war, lacked much in the way of skilled personnel and basic equipment. Prior to its shipment overseas, for example, the 1903d Engineer Aviation Battalion had sustained three major personnel levies in six months, levies which had drawn heavily upon the battalion's trained specialists.[169] Replacements were sparingly furnished by the Army lest its trained engineer cadres be disrupted, with the result that FEAF obtained permission from the USAF to assign Air Force personnel to the engineer units when special category Army military personnel with Air Force (SCARWAF) people were not to be had. In November 1951 the Army reassigned 1,100 basic soldiers from its Engineer Basic Training Center to FEAF; although these persons were inexperienced and not completely trained, they proved worthwhile as potentials for on-the-job training. Unfortunately, however, individuals who had to be trained for operating complicated construction and earth-moving machines in Korea were about ready for rotation by the time that they became proficient.[170]

Throughout 1951 all engineer aviation units were constantly short of equipment and spare parts, shortages which forced improvisations, often to the detriment of the best construction.[171] In-commission rates as low as 0–15 per cent were the rule rather than the exception on critical items of equipment during peak operational periods. In some measure the low in-commission rates were due to the abuse of complicated machines by relatively unskilled operators. Maintenance generally suffered from a shortage of technicians and spare parts, although some improvement in spare parts stocks came in December 1951 when approximately 300 tons of engineer parts, arriving from the Philippines, greatly eased the maintenance problem of the 919th Engineer Maintenance Company.[172] In March 1952, moreover, the initial supply of new

**See* Chap VIII, p 229.

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T/O&E items, requisitioned in July 1951 when the battalions were reorganized, began to arrive in the field. In April 1952 the 931st Engineer Aviation Group received an issue of "50 cubic yard crushers, 2 cubic yard shovels, asphalt distributors, 10 ton rollers and other types of replacement items that heretofore have been practically nonexistent in this theater." [173] Much of this new equipment had been procured as an emergency action from domestic production in the United States, and there was a great variety of makes and models This lack of standardization necessitated some degree of operator and mechanic retraining each time the equipment changed and greatly complicated the stockage of innumerable spare parts. In some cases by the time parts stock had arrived for one make of machine, it would have been replaced by an entirely different make, causing a never-ending cycle of difficulty.[174]

A Summary of Korean Air Facilities Lessons: The Korean airfield construction effort marked the first time that air facilities were constructed in a theater of operations to serve post-World War II aircraft. Gross aircraft weights had more than doubled since World War II, and jet aircraft, with their small wheels, had increased tire pressures from the former maximum of 80 to some 200 pounds per square inch Existing design curves were based upon an average of 3,000 landings on an airstrip per month, while one Korean airfield averaged nearly 10,000 landings in such a period. Heavily loaded jet fighters required either long runways or JATO, and a FEAF study demonstrated that "logistically and from a cost standpoint the extension of runways to 9,000 feet would be far more economical than to use JATO." [175]

To construct these 9,000-foot runways required about 4.5 battalion-months, compared with a World War II average of 1.5 battalion-months required to build a 4,000-foot fighter runway. Eight to ten battalion months were required in Korea to construct a runway, taxiway, and parking aprons for a jet fighter group, the building of a complete airfield thus requiring about two and one-half times the construction effort needed for the runway alone. If a runway was to be used jointly by fighter, bomber, and cargo aircraft, as was the case at major Korean airfields, construction time was considerably increased over the four and one-half months required for fighter aircraft.[176] Such was the magnitude of the construction effort that Fifth Air Force stated the need for one aviation engineer battalion per Air Force operational group [177] In some cases, the Fifth Air Force kept an engineer aviation battalion working more or less constantly on a given Korean airfield, thus essentially requiring of it the tasks normally performed by air installations personnel, a practice which the engineer battalions thought to be an undesirable fractioning of their construction potential since it required the achievement of many small projects.[178]

The completion of the 9,000-foot concrete runway at Taegu allowed the 49th Fighter-Bomber Wing to make a careful analysis of the comparative effectiveness of operating on PSP and concrete facilities. Operationally, the wing noted that tire consumption was over five times as great for aircraft operating from PSP as those operating on concrete; structural damage to aircraft, particularly wrinkled wings and damaged spars and leading edges, was less likely to occur on concrete; a concrete runway presented less of a policing problem and reduced foreign object damage to jet engines, concrete presented better traction for braking or accelerating. In terms of cost, the initial construction cost of a concrete runway was cheaper than a PSP runway and it required fewer man-hours for maintenance; but used PSP could be salvaged, and it was obvious that a bombed PSP runway could be placed in operational readiness much more rapidly than a concrete runway. In time, the construction of a fully operational concrete strip and a fully operational PSP strip were relatively equal, but a minimum operational PSP strip took two weeks less to build than a concrete runway. The 49th Wing study recommended that when time had to prevail over cost, it would be well to construct a minimum operational PSP strip, and, if sus-

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tained operations were indicated for a period of six months, upon completion of the PSP strip, immediate work should be begun on a concrete strip. When operational necessity permitted increasing construction time by two weeks, a fully operational concrete runway should be built in a combat zone in the beginning.[179]

Asphaltic and soil-cement runways at Taegu and Kunsan gave difficulty, and maintenance of asphaltic concrete pavements in some instances was a continuous and costly operation. Every such case was directly traceable to poor sub-base preparation, or to construction performed during freezing weather with less than adequate equipment. Asphalt runways were subject to damage by jet engine blast and fuel spillage. If there was base failure, asphaltic concrete would rot and crack. When a runway had to be resurfaced and remain concurrently operational asphaltic concrete surfacing proved most valuable, but in cases where asphalt runways were employed it was found advisable to construct concrete warm-up aprons at the ends of the runways.[180]

General Ferguson had a good word for PSP: "Although many negative comments have been made about PSP," he stated, "it has been a Godsend and should be kept high on our list of construction materials until something better is developed." Apparently much of the fault attributed to PSP in Korea derived from the fact that it was considered to be a runway rather than correctly a runway surfacing, which could be no more satisfactory than the sub-base upon which it was laid. Based on the premise that a theater air force would always require airfields on short notice in advanced areas which would later be used for heavier and more permanent operations, General Ferguson proposed the following sequence of action: 1) selection of a site acceptable for use by any theater aircraft (heavy transports were often first to land at so-called fighter strips) and capable of expansion; 2) use of PSP on a compacted subgrade (with, perhaps, asphalt treatment for dust control) as the initial runway surface; 3) inclusion in the layout plans of a space for a permanent parallel hard-surfaced strip to be undertaken as soon as minimum facilities were completed for initial operations; and 4) the exercise of judicious limitations upon construction for personal convenience and comfort.[181] These recommendations generally coincided with the sequence of events in air facilities construction recommended by FEAF at the end of Korean hostilities.[182]

MOVEMENT OF FIFTH AIR FORCE TO KOREA

Deployment of Air Units to Korean Bases: That the Fifth Air Force pushed its units into Korean fields as rapidly as minimum facilities permitted advance echelon operations during the spring of 1951 has been seen.* The beginning of the truce talks in July 1951 allowed a short breathing spell in which combat elements could be balanced with their wing structures somewhat more leisurely. Movement of these wings was not simple, for as one observer put it, "Getting a unit supply moved from one physical location to another entails the efforts of a Hercules, the patience of Job, and the cunning of a fox."[183] The relative immobility of wing supporting organizations, the necessity of locating more than one tactical group on forward airfields where hangars, shops, or even parking ramps were not available, and the general inadvisability of concentrating in areas threatened by Communist air power led the Fifth Air Force to effect a flexible deployment not originally comprehended in the wing-base plans.[184]

Rather than to tax forward facilities and to hazard its entire command function, the Fifth Air Force effected an advance and rear echelon functional division in its own headquarters, beginning on 14 June 1951 when the command post closed at Taegu and opened again at Seoul.[185] In the original movement

**See* Chap. II, pp. 64–65.

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plan a consolidation of the entire headquarters and attached supporting units was to have been completed within a month, except for small housekeeping and communications detachments which were to remain behind in Taegu and at K–37.[186] But before the completion of the scheduled movement another plan for emergency evacuation from Seoul emphasized at once the rashness of moving the complete headquarters so far forward and the difficulty of splitting the existing headquarters structure into two echelons.[187] At that time the Fifth Air Force headquarters was organized with a vice commander, an assistant vice commander, seven deputies, and the normal special staffs. Even without mobility considerations, the span of seven deputies and a special staff could not receive the detailed supervision which it merited, and it did not lend itself well to the advance and rear headquarters division which was a "must" in tactical air force functioning.[188] To remedy both aspects of this situation, the Fifth Air Force therefore secured authorization for a double deputy system which it instituted on 14 February 1952. Under this arrangement, the deputy for administration supervised the rear echelon activities at Taegu, including the directorates of materiel, personnel, installations, organization and manpower, controller, and the special staff; the deputy for operations supervised the forward echelon at Seoul, including the directorates of operations, intelligence, and communications.[189]

Before the end of the Chinese spring campaigns of 1951, two Sabre squadrons of the 4th Wing were basing at Suwon (K–13), and in May 1951 the 51st Wing began moving to the same airdrome. Operations from this base were extremely circumscribed by a lack of facilities, and since during May it was the most advanced operational airfield, it was the inevitable choice of all pilots who could not return to their own base. On one day in May, within a space of 40 minutes, 109 jet fighters piled into Suwon without previous warning.[190] Late in June the 8th Wing moved to Kimpo, where in July it had attached to it the RAAF 77 Squadron which had just been reequipped with Meteor–8's.[191] Two months of operations from the Kimpo runways, however, demonstrated the impracticability of employing aged and heavily loaded F–80C's from that base; consequently, between 20 and 24 August the 8th and the 4th Wings traded bases, the RAAF 77 Squadron now being attached to the 4th Wing.[192] Beginning on 16 August and continuing throughout the month, elements of the 67th Tactical Reconnaissance Wing assembled at Kimpo, the tactical squadrons coming up from Taegu and supporting elements moving from Japan to bring the wing together for the first time in its existence.[193]

Having replaced the 27th Wing in August 1951, the 136th Fighter-Bomber Wing completed movement of its fighter group and essential support elements from Itazuke to join the 49th Fighter-Bomber Wing at Taegu (K–2) in September.[194] The 452d Bombardment Wing had already moved to Pusan East (K–9) effective 23 May, and the completion of minimum facilities at Kunsan (K–8) permitted the 3d Bombardment Wing to establish itself there on 22 August.[195] The 18th Fighter-Bomber Wing, with its two F–51 squadrons and the SAAF 2 Squadron, continued to base at Chinhae (K–10), but during the last days of September it moved its staging detachment from the Seoul airport (K–16) to the forward airfield at Hoengsong (K–46). During February 1952 ankle deep mud and a deteriorating runway resulting from the spring thaw threatened to close down K–46, but by 2 June 1952 the situation had so far improved as to permit movement of the entire 18th Group to Hoengsong, where it was in close proximity to the battle line. The 18th Wing's supporting elements remained behind at Chinhae.[196]

During 1951 the 1st Marine Air Wing was based at Pohang (K–3) and at Kangnung (K–18), but the receipt of new F3D jet fighter interceptors by Marine Squadron VMF(N)–513 demanded that this squadron be given longer runways. In April 1952, VMF(N)–513 was accordingly moved to Kunsan (K–8), where it found better operating facilities and

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at the same time provided protection for this light bomber base, which was somewhat vulnerable to possible Communist air attacks from across the Yellow Sea. That same month other 1st Marine Air Wing units were moved in order to get them closer and over to the left side of the ground battle line where the 1st Marine Division had now been shifted. In this movement, called Operation BULL BAT, the 6147th Tactical Control Group gave up its station at Pyongtaek (K–6) and moved to Chunchon (K–47), while Marine Air Group 12 and its subordinate units moved from Kangnung (K–18) to Pyongtaek (K–6); the official changes of station were announced on 15 April 1952.[197]

Establishment of REMCO: These movements located Fifth Air Force tactical units in Korea at the bases which they would occupy during the remainder of the Korean war (see figure 9), but they left major logistical problems unsolved. Several Korean bases now had two combat wings, and with two wings fully in place, there was a conservatively estimated 50 per cent excess in service categories.[198] So far in the Korean conflict, however, the combat wings had never gotten completely in place and set up with the ponderous amount of equipment which they had to carry with them: 2,000 short tons or 10,000 measurement tons of tools, supplies, and equipment for a jet fighter wing, and 2,700 short tons or 12,000 measured tons for a conventional light bomb wing. During the first year of Korean operations the organizations were continually moving either forward or to the rear, or anticipating such a move or rapid evacuation, with the result that heavy equipment carried by the maintenance element of the wings was seldom taken out of their boxes and packing crates. Not only did the many movements of wing equipment severely tax the very limited Korean transportation system, but much shop equipment and critically needed test equipment was lost due to misrouting, pilferage, abandonment, and enemy action. Even the 49th Fighter-Bomber Wing, which had had a comparatively stable existence at K–2, could not get its first machine tool into operation until approximately one year after it had been deployed to Korea.[199] Two-wing bases presented centers of population and equipment which would be prime targets for hostile air attacks. In the autumn of 1951, moreover, logistic support for the Fifth Air Force was lagging: for the F–80's because they were old and now out of production; for the F–84's and F–86's because they were new and not adequately provisioned in terms of combat operation.* A lack of air facilities in Korea, particularly shelter, combined with extremes in summer heat and winter cold, would make any heavy maintenance in the field inefficient, especially in view of the fact that on Kyushu Japanese bases, shops, hangars, base facilities, and indigenous technicians could be had for the taking.

All of these situational factors entered into the Fifth Air Force decision to adopt rear echelon maintenance combined operations (REMCO) but it appears that the comparative experience of the 27th Fighter-Escort Wing and the 49th Fighter-Bomber Wing heavily influenced the matter. Early in October 1950 the 49th Wing (then designated the 6149th Tactical Support Wing) had moved to Taegu (K–2) and had operated there continuously Two small hangars were utilized at first for supply warehousing and subsequently other buildings were erected and reverted to maintenance activities. Winterized tents and small stucco buildings were erected for the winter of 1950–1951, but the only maintenance shelter available was a windbreak without a roof. Maintenance during that winter consisted chiefly of refueling, rearming, and such component replacement as was required to keep the airplanes in flyable condition. Operational commitments were heavy, and as a result of limited maintenance, aircraft either deteriorated or else were reported lost as a result of unknown causes or material failures. After four months of active service under these conditions, 10 F–80C's from the wing were taken over by FEAMCOM's Project REBIRTH, and it was there discovered that an average of

*For a discussion of F–86 supply support *see* Chap. IV, pp 122–25

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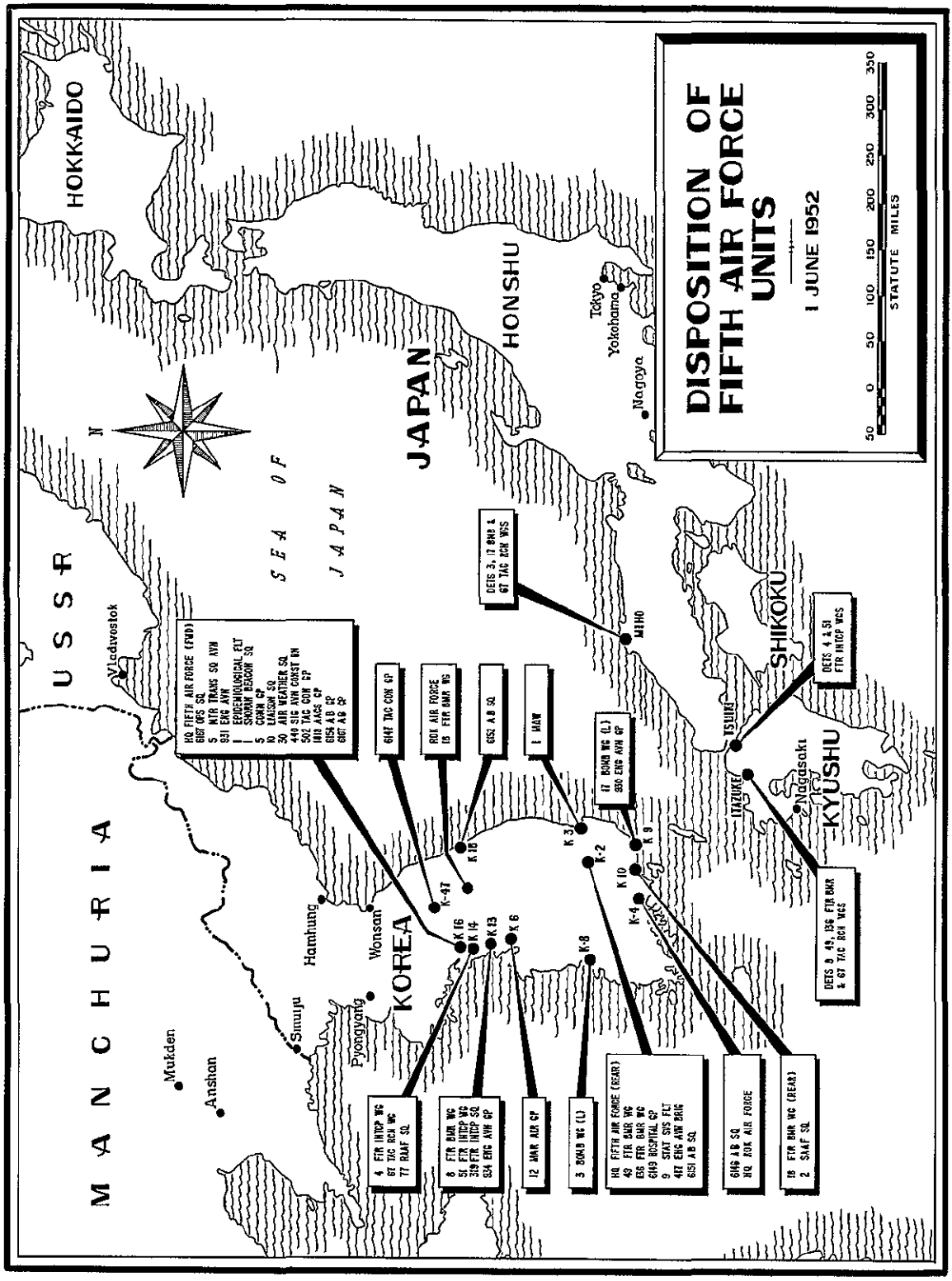


Figure 9

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7,500 man-hours was required to recondition each of these planes. Although efforts were made, the lack of base facilities, space, and power at Taegu airfield prevented the 49th Wing from getting its heavy equipment into operation for nearly a year after it had reached that base. When the 27th Fighter-Escort Wing reached the Far East in December 1950 it operated an advance echelon comprising the fighter group, a small portion of the wing headquarters, and service elements totalling approximately 125 officers and 586 airmen at Taegu airfield. This wing utilized SAC specialized maintenance procedures, and in deference to the local situation it transferred officers and airmen to the field maintenance squadron and to a provisional organizational maintenance squadron, leaving each tactical squadron approximately 70 airmen. Tactical squadrons continued to accomplish the daily and first and third intermediate inspections, the field maintenance squadron performed armament and communications maintenance, and a highly centralized maintenance control section at Taegu kept an up to the minute status report on all wing aircraft. The rear echelon of the 27th Wing settled down in Japan at Itazuke air base, where the organizational maintenance squadron accomplished second intermediate (50-hour) and major (100-hour) inspections. The maintenance goal of the wing was to maintain 48 F–84's in commission at all times in Korea, the remaining 20 to 25 aircraft being retained at Itazuke for maintenance and training. A small detachment from the maintenance squadron went to Korea to accomplish engine changes and to prepare damaged aircraft for one-time flight to Itazuke; when aircraft were so damaged that they could not be flown they were evacuated to Itazuke by C–119 transports. Not only did this organizational establishment result in the desired number of F–84's kept constantly in commission in Korea, but the aircraft of the 27th Wing did not deteriorate in combat as had those of the 49th Wing.[200]

Two other split operations in the Fifth Air Force demonstrated the practicability of rear echelon maintenance. Desiring to keep its critical supply and maintenance functions as close as possible to the FEAMCOM depots, the 4th Fighter-Interceptor Wing from the time of its arrival in the theater in December 1950 maintained a rear echelon at Johnson air base, a location somewhat too far removed in distance from the operating bases in Korea to give complete satisfaction.* The original intention when the 452d Bombardment Wing began to transfer from Miho to Pusan East (K–9) in May 1951 had been to move the entire wing, but a lack of shelter delayed the movement of maintenance elements. Working conditions in Korea proved so unfavorable that the 452d Wing began accomplishing aircraft inspections normally at Miho and over the course of several months a specialized maintenance system was evolved on the 27th Wing model: under the supervision of the commanding officer of the 452d Maintenance and Supply Group, a detachment of 342 men, comprising the maintenance squadron and an organizational maintenance squadron, accomplished second intermediate, major, and special inspections at Miho. Aircraft were scheduled for inspection at the tactical group to insure that unnecessary peak maintenance loads were avoided wherever possible.[201] Comparison of the aircraft in-commission rates of the 452d Wing with those of the 3d Bombardment Wing, which moved its complete strength to Kunsan (K–8) late in August 1951, demonstrated the practicability of rear echelon maintenance: from July to December 1951, the in-commission rate of the 3d Wing dropped from 78 to 65 per cent, flying hours dropped from 5,425 in July to 3,904 in December, and accident rates increased. For the same period accident and abort rates dropped in the 452d Wing, while the in-commission rates rose from 57 per cent in July to 82 per cent in November and flying hours increased from 3,884 in July to 4,612 in December. Staff visits indicated that 3d Wing B–26's were in poor condition, while the aircraft of the 452d Wing were in excellent condition.[202]

Basing its actions upon the situational factors and the positive records of achievement by organizations utilizing rear echelon mainte-

**See* Chap IV, pp 122–25

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nance, the Fifth Air Force on 18 August 1951 ordered the establishment of rear echelon maintenance combined operation established for F–80 and F–84 aircraft At Itazuke the 136th Maintenance and Supply Group, augmented as mutually agreed with personnel from the 49th and 136th Fighter-Bomber Groups, performed maintenance for aircraft of the 49th and 136th Wings. Rear area maintenance on F–80 aircraft of the 51st and 8th Wings was performed at Tsuiki by the 51st Maintenance and Supply Group, augmented with personnel from the 8th Wing. Maintenance accomplished at forward airfields was limited to preflight, daily, and postflight inspections, minor battle damage and minor field maintenance; intermediate inspections (except second intermediate for F–84's), temporary repairs for one-time flights; and limited engine build-up and bucket changes Supply support at Itazuke and Tsuiki was also to be furnished by the 136th and 51st Wings.[203]

Rear echelon maintenance for F–84 aircraft began at Itazuke on 31 August, when the 49th Wing sent its detachment to that base. The 49th Wing detachment provided organizational maintenance on its own planes to include second intermediate inspections, 100-hour inspections, technical order compliance, corrosion control, and all field maintenance required except engine build-up and minor engine overhaul which was the responsibility of the 136th Wing. The 136th Base Supply served both wings at Itazuke, and in December 1951 it inaugurated supply control procedures effective in both fighter groups' approximately 25 hours in advance of a due inspection the crew chief of an F–84 at Taegu prepared a forecast sheet listing items of supply which would be required to return the plane to proper condition, and the forecast sheets, forwarded to the technical supply control office at Itazuke, furnished the means for advance requisitioning of parts which could be on hand when the F–84 reached the REMCO. On 4 April 1952 the system reached a logical conclusion when the two wings decided for complete integration: the 136th assumed command responsibility for the 188 men assigned at Itazuke, with each wing furnishing half of the personnel. Fourteen dock crews would perform all inspections up to 120 per month, and a forward control office would be established to monitor the flow of aircraft to and from Itazuke. While at Itazuke both airmen and aircraft would lose organization identity so as to preclude any favoritism.[204]

The 8th and 51st Wing implemented similar procedures at Tsuiki on 24 August 1951, but the production rate of their REMCO was hampered by the old age and many repairs needed on the F–80C's which they received from Korea In November 1951, conversion of the 51st Wing to F–86's led to the movement of the 8th Wing detachment to Itazuke, freeing Tsuiki for concentration upon F–86 maintenance.[205] In December 1951 the rear echelon of the 4th Maintenance and Supply Group moved from Johnson to Itazuke, where in January 1952 it began to handle major damages and 100-hour inspections on Sabrejets of its parent wing.[206]

Establishment of a B–26 REMCO at Miho was complicated by the fact that each of the three cooperating wings occupied separate Korean bases and had no spare service units for Miho. The 314th Air Division assumed supply support (less B–26 service stock) and base service support, and during November 1951 the 3d Bombardment and 67th Tactical Reconnaissance Wings sent maintenance detachments to Miho, where they joined the establishment already working for the 452d Wing. These detachments were charged to make battle-damage repairs, structural repairs, engine build-up, engine changes, aircraft modification, equipment installations, technical order compliance and 1,000-hour inspections. On 22 March 1952 wing representatives agreed to consolidate their detachments, with personnel losing their identity as far as work was concerned but remaining accountable administratively to their parent organizations. This plan was effected on 10 April 1952, but the activity was again reorganized in June pursuant to a Fifth Air Force directive placing the B–26 REMCO under control of the 17th (formerly the 452d) Bombardment Wing. Now the 3d, 17th, and 67th Wings would fur-

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nish a total of 28 officers and 820 airmen, proportionately figured according to their share of the expected workload, and wing TO&E property would be shipped to REMCO for accountability as needed for the performance of all major and second intermediate inspections.[207]

The winter of 1951–52 and the spring of 1952 was thus the formative period for the REMCO concept, which followed somewhat different developmental lines at Tsuiki, Miho, and Itazuke. At first, organizational structures and command jurisdictions were very complex. The natural tendency on the part of all commanders to maintain unit integrity and control of all unit personnel initially resulted in much duplication in supply accounts, motor pools, and maintenance shops, but the trend was toward the elimination of such duplication and the centralization of responsibility for the operation of the REMCO with one wing. Before the 8th and 18th Groups were converted to F–86 fighter-bomber models, the Sabre REMCO at Tsuiki would be centralized under control of the 51st Wing late in 1952. An additional complexity arose from the fact that Fifth Air Force units were tenants at Japan Air Defense Force (JADF) bases, but suitable arrangements were gradually worked out at Itazuke and Miho whereby the JADF as the host command provided normal base logistical support in the form of supply requisitioning, storage and issue, motor pools, base shops, and the myriad of other service support functions required. Different arrangements were needed at Tsuiki where the Fifth Air Force units were the main activity and JADF had only a small detachment responsible for maintaining existing facilities and preparing the required construction programs.[208]

These rear area consolidated maintenance plans represented a workable solution to Korean air logistical problems, but their success grew from the somewhat unusual situation prevailing locally. Certainly the operation of centralized REMCO establishments in a global war would be risky unless air superiority was first obtained. In the Fifth Air Force, centralized maintenance benefited operations by providing a higher aircraft in-commission rate, but at the same time it undoubtedly lowered unit integrity and individuality: referring caustically to the "super service station" at Miho, the 13th Bombardment Squadron commander commented in April 1952 that "when such an organization dictates to a tactical squadron how much flying time it can or must fly to meet the production line schedule, all unit control is lost."[209] The 4th Fighter-Interceptor Group candidly analyzed the defects of such a system in January 1952. The time lost in ferrying aircraft to a rear echelon, trips subject to vagaries of weather, detracted from the combat availability of pilots and aircraft, and lowered the over-all combat capability of the tactical group. Even more important, the practice of concentrating experienced maintenance men at the rear echelon deprived newly assigned, inexperienced mechanics and specialists in the tactical units the benefits of association with seasoned personnel. Such a process, coupled with personnel rotation, seriously reduced the mechanical skills of unit technicians in the 4th Group While such methods and procedures might be justified in Korea, the 4th Group considered them "obviously inadequate for operations conducted in all-out war."[210] At the end of the Korean conflict, FEAF logisticians were cautious in their evaluation of REMCO: "Under the combat conditions existing in Korea, the REMCO system of support of tactical operations resulted in a more effective method of maintaining combat aircraft." Whether it would prove applicable in other overseas theaters would depend upon the local situation which prevailed at such time and place as REMCO might be utilized.[211]

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Chapter IV

COUNTER-AIR COMBAT

"Any resemblance between the air-to-air war over Korea and any past air-to-air war anywhere is purely coincidental," wrote Lt. Col. Albert S. Kelly, commander of the 51st Fighter-Interceptor Group.[1] While the Korean air war was marked by many unusual aspects, the counter-air phase was even more heavily influenced by considerations rendering it unique. For political reasons and in accord with JCS instructions, the United Nations Command maintained a line three miles south of and parallel to the Yalu River as an artificial foul line, beyond which UN aircraft were not authorized to fly without especial order. Under no circumstances were UN aircraft permitted to violate the sanctity of the Manchurian or Siberian borders of Korea. This line of restriction constituted a barrier behind which enemy aircraft could take off, form, climb, and maneuver for penetration southward into the battle area completely unmolested Moreover, the enemy was able to withdraw from the battle area and recover for landing under the same conditions.

With a few exceptions the northwestern quarter of North Korea was the scene of counter-air operations. (See figure 10.) The area in which the enemy was normally contacted was even more restricted, lying between the Chongchon and Yalu rivers, bounded on the west by the Korean Bay and on the east by a line running roughly between the Sui-ho Reservoir and the town of Huichon. This area was popularly called "MIG Alley" Obviously, the enemy was operating from three main bases established close to the Yalu: Antung, Ta-tung-kou, Ta-ku-shan, and later from an additional base at Fen-chen. Each of the airfields was capable of supporting continued operations of over 300 fighter aircraft; situated well within sight of many air battles, they gave the enemy a tremendous advantage in fuel-consumption and simultaneously offered a refuge for planes which received battle damages or met mechanical difficulties. There was some indication that Mukden area airfields were used to back up the forward facilities and on occasion to serve as alternate recovery points.[2]

From these Manchurian airfields the Communists were theoretically able to operate efficiently over all of enemy-held North Korea. To have done so, however, the MIG–15 would have required external fuel: the report of a Special Aviation Inspection Group from Communist China written in September 1951 stated that MIG-type fighters based at Antung could operate within a combat-radius of 80 miles, a radius generally coinciding with the boundaries of MIG Alley.[3] Utilizing external fuel tanks, MIG–15's frequently penetrated to Pyongyang and a few, probably on photo reconnaissance, got as far south as Suwon, and USAF figured the maximum MIG–15 range at 224 miles. More extensive longer-range MIG effort would have undoubtedly strained Chinese logistics for an adequate supply of external tanks, and it is possible that Red logistical support may have been the determining factor in limiting the MIG range. General Weyland, however, believed that the major reason for the Communist failure to launch an air attack in force from north of the Yalu was that "he operates under restric-

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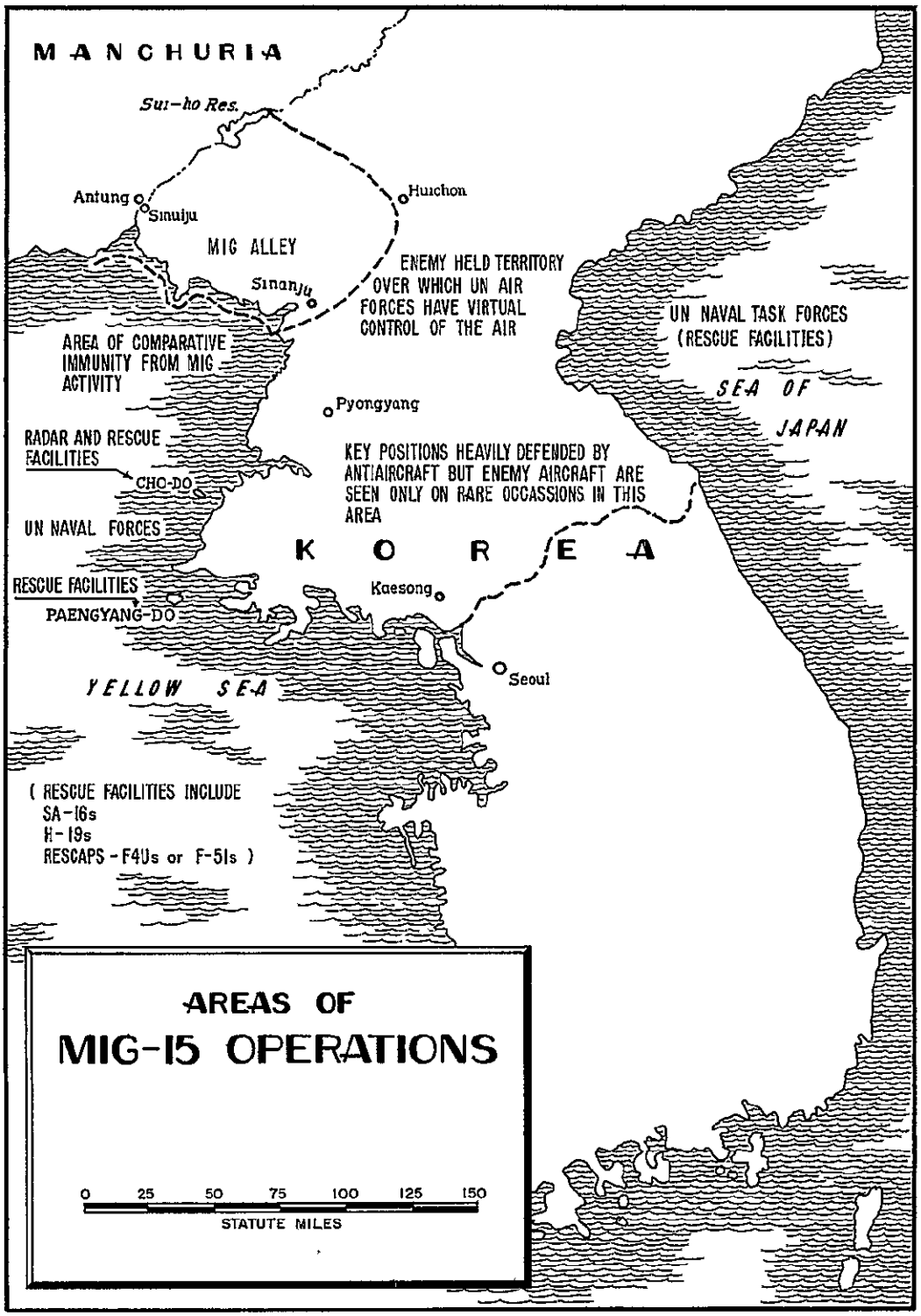


Figure 10

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tive directives to reduce the likelihood of retaliation."[4] Probably due to their fear of UN reprisals and their external fuel situation, the Chinese made determined efforts to develop new airfields south of the Yalu in the autumn of 1951.*

Pilots flying the MIG–15's also displayed a peculiar reluctance to fly or fight over water, probably because of a desire to avoid being shot down and captured in an area controlled by UN naval units. This restriction on the MIG's offered UN pilots a sort of a "sanctuary" of their own because disabled aircraft or those very low on fuel could be reasonably certain that they would not be pursued any distance out to sea.[5] It is possible that this same Communist desire to maintain the security of the identity of their pilots, as well as to prevent a MIG–15 from falling into UN possession, may have prevented any all-out Red air attack against land areas held by UN ground forces.

Bound by these artificial rules, the maintenance of air superiority by UN air forces in Korea was primarily the work of Sabrejet air patrols, which turned back MIG–15 squadrons before they could reach the UN fighter-bombers as they attacked targets in North Korea The maintenance of UN air superiority also depended upon the B–29 force of the FEAF Bomber Command which continuously neutralized enemy airfields in North Korea, thus preventing a determined effort of the Reds to prepare such facilities for the basing of MIG–15 fighters south of the Yalu.

TRENDS IN COMMUNIST AIR ACTIVITY

The CCAF Order of Battle: Who flew the MIG–15's and what they planned to gain, like the great variations in their aggressiveness, remained matters of somewhat intelligent guessing in the UN Command It is certain that the USSR provided Communist China lavishly with aircraft: by a reported agreement in May 1950 between Premiers Stalin and Mao, the former was alleged to have promised the CCAF some 1,000 aircraft by mid-1952, together with a large number of training personnel to include pilots and technicians.[6] FEAF estimates indicated that this agreement was not only met but was bettered in December 1950 the CCAF was believed to have 650 combat aircraft available in China, including 250 fighters and jets, 175 ground-attack planes, 150 bombers, and 75 transports. By June 1951 the CCAF total strength had increased to 1,050 aircraft, the chief gain being in jet fighters, of which an estimated 445 were possessed. By June 1952 the enemy had an estimated 1,830 aircraft, including 1,000 jet fighters.[7]

Never altruistic and proverbially frugal with its material resources, the USSR had built up the air force of its Chinese satellite, simultaneously replacing the 341 MIG–15 aircraft destroyed by USAF airmen in the period ending 30 June 1952. Several plausible answers emerged to explain why the USSR supported such a costly venture: by supporting its satellites Russia gained access to airfields stretching from the Arctic to Indo-China, it built satellite air forces for eventual united employment, and it enjoyed the unique opportunity afforded by the Korean conflict for testing aircraft and training personnel.[8] Without much doubt, at least a part of the MIG–15's were flown by Russian or European satellite pilots: such was reported by covert intelligence sources, from time to time enemy pilots who bailed out were observed to be Caucasian types; and Sabre pilots frequently encountered adversaries of considerable skill who evidently accompanied a MIG formation in the role of instructors. In 1953 a Polish air force defector stated that many Soviet flight instructors in his country previously had fought in Korea against the Sabres.[9] Varying degrees of aggressive pilotage indicated that Communist air units were rotated through a six- to eight-week training cycle in Korea, by the same token, on occasions when MIG's were most aggressive, there was a variety of otherwise unintelligible aircraft markings which indicated that the best pilots from several air units had

*See pp. 129–30

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been sent out.[10] It was FEAF's opinion that: "The MIG . . . and its equipment . . . are undoubtedly being subjected to combat testing and its pilots are at the same time acquiring priceless experience and knowledge of USAF aircraft and tactics." [11]

Encounters with MIG pilots indicated that the Communists generally lacked "average" pilots: by USAF standards they were either "very good" or "below average." Whatever tactic the enemy employed, he always banked heavily upon surprise, frequently using decoys to set Sabres up for an attempted kill. When UN aircraft turned into an attacking enemy flight, contact was generally broken by the enemy. Gunnery was frequently poor, with notable exceptions against B–29's where it may be supposed that Soviet personnel were interested in seeking tactics of value against possible bomber raids of the future.[12] Similarly, enemy aggressiveness appeared cyclical, indicative of new infusions of green pilots who gradually became more self-confident as their stay wore on at the "Soviet School of the Yalu." Towards the end of each cycle the 4th Fighter-Interceptor Wing noted that enemy element and flight leaders definitely had improved their skills. "They still made mistakes," summarized the wing, "mistakes which we consider stupid and which account for a large part of the favorable rates of kills to losses which we enjoy—but they are trying and learning." [13]

Employment of Communist jet fighters varied from month to month (see figure 11), and for unknown reasons there were frequent stand-down periods. At first adverse weather limited MIG operations, but gradually they began to fly when formerly they would have been grounded. There was no positive proof that enemy air efforts were limited by logistical difficulties, although some of the stand-downs may have come when the Communists met an excessive loss rate. FEAF received continual reports of shipment of aviation supplies into Manchuria via the Trans-Siberian Railway, and in two years of combat only one report specifically indicated that any slackening of MIG operations was due to a shortage of supplies. The enemy twice demonstrably proved that he could sustain operations at an average daily sortie rate of 200 per day for at least 10 days.[14]

Tactical Employment of the MIG Force: During the spring of 1951 many UN pilots commented that the Communists lacked systematic and organized tactics of aerial warfare,[15] but gradually the enemy was revealed as an astute opponent who was searching for the most profitable means of employing his superiority of MIG numbers. There was evidence that MIG employment was following a preconceived plan, which, somewhat oversimplified, appeared as follows: between 1 November 1950 through January 1951 the MIG's appeared intermittently in flights of four or small sections of six to eight aircraft, seldom venturing more than a few miles south of the Yalu but occasionally penetrating to Sonchon and Taechon. Often F–86's would patrol the south bank of the Yalu from Sinuiju to the Suiho Reservoir while MIG's would parallel the friendly course on the north side of the river, doing slow-rolls and wingovers. The usual MIG tactic was a scramble from Antung airfield (often observed by UN pilots over Sinuiju) and a rapid climb to superior altitude over Manchuria, whence they would swoop down in closely knit flights, usually of four aircraft. Before reaching the patrolling Sabres from high astern, the enemy flight would often split, sending an element of two in front of the Sabres as a lure while the remaining MIG's would close rapidly from 5 to 7 o'clock high. Only one firing pass would be made, after which all of the MIG's would head for Manchuria. The MIG's usually timed their attack to take place some 20 to 25 minutes after the Sabres arrived in the area, thus designing to hit the UN aircraft at a moment when they were running short of fuel. Such hit-and-run tactics were indicative of the small numbers of first-line MIG–15's available to the Communists in this early period.

The hit-and-run tactics continued in the months from February through April 1951, but MIG's were frequently engaged in increasing numbers over the Sonchon-Taechon area and were occasionally seen as far south as Sinanju. Their most common tactic was a

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A COMPARISON OF MIG–15 AIRCRAFT OBSERVED, ENGAGED, AND DESTROYED

November 1950–June 1952

Month	MIG–15's Observed	MIG–15's Engaged	MIG–15's		
			Des	Prob Des.	Dam
1950					
November	314	139	3	2	11
December	361	260	8	2	6
1951					
January	189	189	4	2	9
February	102	86	0	0	0
March	374	243	9	4	14
April	531	413	14	4	40
May	280	137	9	1	15
June	389	309	14	1	34
July	370	194	9	1	6
August	309	197	4	0	3
September	1,177	911	14	2	34
October	2,573	2,166	32	8	50
November	2,326	1,381	20	9	56
December	3,997	1,849	27	5	34
1952					
January	3,663	951	31	3	19
February	3,608	621	17	4	43
March	2,662	527	39	9	74
April	1,398	540	44	6	51
May	620	396	27	3	24
June	298	162	20	2	4

Source FEAF Intelligence Roundup, #116, 24 Nov 1952

Figure 11

high stern attack made from out of the sun by elements of two MIG's which would open fire from an out-of-range position, continue to fire through the target of the friendly aircraft, and then, exploiting superior climbing ability, zoom back into the sun. Often an enemy flight would repeat this maneuver several times. Bolder ventures were now evidently permitted by augmented numbers of MIG's and by pilots who had accumulated enough combat experience to evaluate and exploit the advantages of their aircraft

During May and June 1951 the MIG–15's were frequently over Sinanju with scattered observations as far south as Pyongyang. In these months the MIG's introduced what Sabre pilots called a "Yo-Yo" tactic, in which 20 or more MIG's orbited at an altitude superior to a UN formation. Preferably from up-sun and usually in elements of two the enemy would peel off and attack the Sabres from high astern, come in firing, and zoom back up into another pool of orbiting MIG's.

During the late summer and autumn of 1951 the Communists made their bid to overwhelm the UN air forces, and MIG's were observed and encountered with great regularity over Pyongyang and were met on numerous occasions in the triangle formed by Sinuiju-Chinnampo-Wonsan. Four unidentified aircraft, believed to have been MIG–15's, passed below Seoul on 3 December 1951. Day after day during October, November, and December the Communists committed more than 100

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MIG's, and on 29 December some 360 MIG's were out on a single mission. Exploiting his superior numbers against the slender resources of the 4th Fighter-Interceptor Wing, the enemy turned to a skillful use of pincer and envelopment tactics: often a force of 60 to 80 MIG's crossed into Korea at the Sui-ho Reservoir on a southeast heading, dropping off flights or small sections to engage UN Sabre patrols north of the Chongchon River. As the main body continued southward, scouting forces for flank patrol went to Wonsan. At the same time a similar force from Manchuria proceeded down the west coast of Korea, also dropping off pockets of resistance and dispatching scouting flights to Chinnampo and Cho-do Island. Altitudes of these southward flights were usually above 35,000 feet Over Pyongyang the forces converged, dropping to 15,000 to 20,000 feet, and swept back northward over the main supply routes in search of UN fighter-bombers, homeward-bound F–86's, or stragglers. To cover the mass withdrawal, a fresh section of MIG's usually penetrated Korea at least as far south as Sinanju.[16]

The Communists continued these tactics until the latter part of January 1952, when the "trains" were broken up in favor of 2-, 4-, or 6-aircraft formations. Unlike the massed formations, which had contained large numbers of new and unaggressive pilots, the smaller formations as a rule used very good tactics, appeared to be well led, and seemed to be using a late-model high-thrust MIG–15 Their ability to out-turn, out-climb, and outrun the F–86's at altitude was called "outstanding," and their gunnery was improved.[17] The smaller MIG formations were now flown at both high and low altitudes, a few flights being directed against the augmented Sabre force (the 51st Wing had converted its two squadrons to F–86's in December 1951) while larger numbers of Red aircraft attempted to strike the UN fighter-bombers. During February 1952 the MIG's showed little or no desire, except on widely separated occasions, to fly south of the Chongchon, and during the following month few MIG's came south of Sinanju. Although reluctant to fight at altitudes above 40,000 feet, the Communists seemed determined always to maintain initial altitudes superior to the Sabre patrols. When, after December 1951, F–86's entered their patrols at 40,000 feet, the MIG's went higher: on 4 February enemy flights were observed at 53,000 feet.[18] Below the contrail level MIG flights were aggressive, and in May the 49th Fighter-Bomber Group lost two F–84's to the enemy jets.[19] This threat to the fighter-bombers was countered by holding the Sabre screen in closer to them.

During May, June, and July 1952 the Communists further reduced the MIG–15 sortie rate but sought to improve the quality of their interception effort. On 18 May a flight of F–86's was attacked by two MIG's which dropped down out of an overcast, indicating that the Reds had begun to employ ground radar to control and vector their aircraft into the most favorable position for an interception. The enemy continued to operate small flights of two to six aircraft, generally flying at lower altitudes in an effort to attack UN fighter-bombers. Communist air operations were concentrated over northwest Korea near the Yalu River, infrequent flights being made as far south as Pyongyang but usually when F–86's were elsewhere. Engagements were no longer of a training nature, but displayed the aggressiveness of more proficient Red pilots. Strangely enough, however, the Communists made no air opposition to UN fighter-bomber attacks against the Sui-ho hydroelectric plants on 23 June, although 250 swept-wing aircraft were to be seen at Antung and Ta-tung-kou airfields just a few minutes before the attacks. During the course of the bombing some 160 MIG's took off from these airfields, but they withdrew into the interior of Manchuria. The most likely hypothesis was that the enemy was unaware of the UN target and made an error of judgment in dispatching his aircraft to the rear before discovering that Sui-ho was to be attacked.[20]

Communist Night Air Defenses: While Red night fighters had been occasionally sighted earlier, the Communists decidedly increased their night activity in November 1951 when the B–29's shifted to night shoran operations. First damage to a night-flying UN aircraft by

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hostile fighters came on 16/17 November, when two interceptors caught a 3d Group B–26 in a cone of searchlights near Sunchon, sending it limping home with a 10-inch hole in its wing caused by a 20-mm. shell.[21] MIG–15 jets began to box B–29's caught in searchlights later in November and effected some damage in December, especially on the night of 23/24 December over Uiju when searchlight-cooperation attacks were pressed within 50 feet.[22]

For some unexplained reason, however, Communist night activity dropped off in the early spring of 1952, only 23 night sightings of hostile aircraft being reported in January, 10 in February, 6 in March, out of these numbers only nine firing passes were made against friendly planes.[23] Following closely after the indicated establishment of a GCI capability, in June 1952 hostile night sightings jumped suddenly to 76 sorties, 28 being positively identified as conventional aircraft and 13 as jets. On the night of 10/11 June, moreover, enemy jet fighters, cooperating with searchlights at Kwaksan, destroyed two B–29's and badly damaged a third.* Indications were that a good portion of the enemy night sorties were for training. radar tracks plotted out of Manchuria and along the west coast of Korea usually followed a set pattern, crossing the same checkpoints night after night. In the few cases when enemy passes were observed, friendly crews believed that GCI or some other form of ground control was used, but the enemy apparently made no use of airborne intercept radar.[24]

*See Chap VI, p 185.

UNITED NATIONS AIR-TO-AIR COMBAT TACTICS

Sabre Patrols: "Tactics that are successful in the morning may be obsolete in the afternoon," noted the 51st Fighter-Interceptor Wing study on tactical doctrine.[25] For the most part Communist MIG–15 pilots dictated the tactics which the Sabres had to employ: MIG's usually possessed the advantage of initial altitude and at the high speeds of jet aircraft it was nearly impossible for an F–86 to force combat with a MIG–15 which did not desire to fight. The MIG force almost always possessed the advantage of superior numbers, and as a general rule it may be said that the MIG usually had the privilege of the first pass against a Sabre formation, after this first pass the question of whether or not the MIG was destroyed depended upon the aggressiveness and skill of the Sabre pilot. The purpose of the Sabre patrols, however, was not to destroy enemy aircraft but to screen the enemy air away from friendly planes. To this end the 4th and 51st Wings adopted procedures which, if they could not overcome the advantages allowed by the proximity of MIG bases to the combat area, kept the enemy jets under control.

The fundamentals of tactics which were going to prove useful against the MIG–15's in the given situation of Korea were soon apparent to Detachment A, 4th Fighter-Interceptor Group, as it began operations from Kimpo (K–14) on 16 December 1950. These fundamentals were: maintenance of a high cruising speed in the combat patrol area, the employment of a "jet stream" of patrols, the utilization of a "fluid four" aircraft formation, and the maintenance of a high degree of pilot aggressiveness. Although these tactical lessons were becoming apparent by the time that the Sabres were forced to withdraw from Kimpo on 2 January 1951, some time was necessary before they could be melded together to fit the problem at hand.

During the first month of their operations, Sabres were employed in formations ranging from 4 to 16 aircraft, but it was soon apparent that squadron formations of jet aircraft were impractical. Large formations squandered needed fuel in lining-up and taking-off, reduced flight speed in order to maintain flight integrity, limited area coverage to the air space through which the formation passed, limited firepower in that only a few guns of a large formation could be brought to bear, hampered maneuverability in the

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thin air of high altitudes, and provided enemy pilots, and later radar controllers, with large targets.[26] The enemy, moreover, was astute enough to time his attacks to coincide with last moments of the Sabre patrol, catching the F–86's as they were running too short of fuel to give combat and then to return home. The answer to both of these problems was what the 4th Wing called the "jet stream": F–86's were dispatched by flights, each flight staggered to arrive in the search area at 5-minute intervals at an altitude just below the contrail level so that MIG's flying higher could be easily located. Flying from Kimpo or Suwon (K–13), the Sabres had enough fuel to remain on station for some 30 minutes, but to give a margin of safety and avoid last-minute combat with scanty fuel, they customarily planned to withdraw after 20 minutes' patrol, thus enabling them to stay and fight 10 more minutes if the enemy attacked when they were leaving the patrol area.[27]

The optimum flight composition was a "fluid-four," comprising four F–86's spaced generally in fingertip formation. When MIG–15 pilots also began to demonstrate some proficiency with 4-aircraft flights, the 4th Wing in April 1951 for a time experimented with 6-aircraft flights, the idea being that the Sabres could better handle the MIG flights, which under attack usually broke up into pairs and then into single aircraft.[28] Such a formation of 6 Sabres was subsequently used on occasion, but the 4th Wing found it generally unwieldly in fights involving a large number of enemy aircraft and returned to the 4-aircraft flight as the optimum permitted under the circumstances in Korea.[29]

The jet-stream and fluid-four principles proved well calculated to exploit the outstanding characteristics of the Sabres. Each flight of four F–86's climbed to altitude as quickly as possible and joined up in formation en route to the target area. Each flight was briefed to go to a definite geographical sector of the combat zone, providing eight or more separate, high-speed forces all within easy supporting distance in time and space. When an offense in depth was required, the jet stream could be projected into the combat area, divided by altitude, time, or route in order to provide depth and breadth to the force. The first Sabre flight to spot enemy fighters called out their location, altitude, and heading; when a fight developed, all Sabre flights converged on that point, those flights not being able to get to the main engagement being able usually to intercept stragglers or elements thrown out of it. The jet-stream tactic thus exploited both mass and flexibility, brought both security and economy of fuel, and, with each Sabre flight operating on its own, increased the normal aggressiveness of the individual Sabre pilot. Staggered take-offs and patrols at different altitudes, with the consequent variation in fuel consumptions, kept landing patterns of returning Sabres full but not overcrowded.[30]

For a short time at the beginning of their Korean operations, the Sabres cruised in their patrol areas at relatively low airspeeds in order to conserve fuel and extend their time of patrol, but the unwisdom of such a practice was almost immediately demonstrated: not only were the MIG's able to make effective passes from the rear, but the F–86 was unable to get up enough speed to engage the MIG As a result of this experience the Sabres found it essential to maintain a Mach of at least .85 and preferably above .87 if there was any danger of an enemy attack. The maintenance of a high cruising speed was the best method permitted a Sabre pilot to keep his rear clear because it generally forced the enemy to make a cut-off if he intended to attack.[31]

The jet-stream, fluid-four, and high-speed cruising permitted the optimum utilization of the F–86 aircraft, but victory in the air battle could be achieved only by an aggressive pilot. Although many of the Sabrejet pilots had been among the USAF's fighter aces of World War II, they generally agreed that the combination of high speed and inability to see for any great distance at high altitudes created a fighting situation that required more judg-

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ment and skill than any previous air-to-air fighting they had known. When enemy aircraft were sighted, the Sabre leader had to give his full attention to keeping them in sight; for the leader to divert his attention for an instant meant in most cases that the enemy would be lost from view. Under these conditions the wingman's duty became even more important, since he had to do all the covering toward the rear Riding a little high and out, the wingman was also poised to strike at any enemy aircraft that might attack the leader. Such was especially true in MIG Alley, where the enemy with advantages of altitude, air speed, and position could almost always be expected to get the first "bounce." Whether in setting up an attack against MIG's or in evading and then counterattacking an initial MIG attack, the advantage in high-speed jet combat lay with the aggressive pilot: "The only time defensive thought and action is permissible to a fighter pilot," ruled the 4th Group, "is when he must neutralize a momentary tactical advantage gained by the enemy under conditions of a surprise attack." [32]

At the fantastic speeds of swept-wing jet combat Sabre pilots were carried into and out of contact with enemy aircraft in a matter of seconds: often less than 3 seconds elapsed between first sighting through engagement to the break-off and an average length firing burst ran anywhere from 2 to 3 seconds, with some 65 per cent of MIG's kills being scored on the first burst. Split-second accuracy in gunnery was thus required, and properly aimed fire from 1,500 to 500 feet was the best insurance of killing a MIG. Successful attack at high altitude required a well-planned cut-off, with the attacker flying an angle of interception placing him smoothly in range of the enemy. When gunsights were not operating properly,* many Sabre pilots scored kills by firing up the MIG's tail pipe, but a tail chase, even with a slight overtaking speed advantage, often covered so many miles that the MIG could usually reach his Yalu sanctuary. Any means of forcing a pursued enemy to turn, such as a burst of tracers, increased the possibility of an effective firing pass. When a MIG pilot slipped in behind a Sabre formation toward 6 o'clock, the procedure was always to break into him; at best the MIG could get a snap shot, and usually he would pull up and away when the Sabres broke into him. Should a MIG arrive unannounced in close trail, a steep, high Mach, high "G" descending spiral was the best Sabre tactic.[33] Once having cleared, the Sabres were expected to undertake the offensive. "Many times," cautioned the 4th Group, "the tide of air battle has been changed by aggressive attack on superior numbers of enemy aircraft, ejecting enough confusion and panic into the situation to cause the larger force to take the defensive and attempt to run. Always remember, the enemy is probably twice as scared as you are and only half as skillful." [34]

Sabre Escort for Other Jet Aircraft: Ordinarily the twice daily Sabre jet-stream Yalu patrols provided cover for other UN air activity to the southward, but when slower UN jet aircraft had to go into critical areas they drew Sabre escort. Escort for jet reconnaissance of the fighter type was not particularly difficult, although it was expensive in Sabre effort. When reconnaissance targets were located in MIG-infested areas, 12 to 18 Sabres normally escorted an RF–80 aircraft; generally, however, three 4-ship escort flights stacking up 500, 2,000, and 5,000 feet above the reconnaissance plane were adequate. The Sabres normally escorted the RF–80 to its reconnaissance target and usually one Sabre flight returned to base with the photo plane, the other two flights being dismissed for patrols as soon as the formation was out of the danger area If the formation came under MIG attack the Sabres could be expected to break up organized attacks upon the RF–80, and in an extreme emergency the RF–80, while no match for the MIG, could be expected to hit the deck and continually turn inside the fast enemy jets, forcing them to exhaust their fuel without getting a decent firing pass.[35]

**See* pp 119-20

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When an RF–86 was used for reconnaissance photography, it was integrated into the lead flight of Sabres in a formation similar to that employed for RF–80 escort; it assumed the lead while photography was taken and then again became wingman to the Sabre leader.[36]

The Sabres had somewhat more difficulty in providing escort for bomber-type jet reconnaissance aircraft. When a single RB–45* required escort, 12 Sabres, divided into three 4-plane flights, was the desired number of escorting fighters, two flights flying parallel to the RB–45 to the left and right and 1,500 to 2,000 feet above, while the third flight flew to the rear and 6,000 to 8,000 feet up. If only 8 Sabres were available for escort, elements of 2 fighters flew the parallel courses while the rear flight still comprised 4 aircraft, a minimum number capable of defending this most vulnerable position.[37] In attempting to escort the RB–45, however, the Sabres encountered a problem of different optimum altitudes of operation: the F–86's could provide maximum defensive escort for the RB–45 at from 30,000 to 32,000 feet, but the RB–45 had its best range and maneuverability at about 40,000 feet. Events of early April 1951, moreover, demonstrated that the RB–45 could be none too sure of the effectiveness of his Sabre escort even when he operated at their optimum altitude. on 9 April, 4 MIG–15's penetrated through 12 escorting Sabres to get on the tail of an RB–45, where, amazingly enough they discharged most of their ammunition without scoring a single hit FEAF immediately provided the unarmed RB–45's with a tail installation of two fixed .50-caliber guns, which fired tracer ammunition, but it was unable to secure tail-warning radars and radar-operated guns for them.[38] After another harrowing experience on 9 November 1951 when an unescorted RB–45 was intercepted by 9 MIG–15's near Haeju, only to escape because of remarkably poor Communist gunnery, FEAF restricted the RB–45's from daylight penetrations of sensitive areas, and in February 1952 they turned to night photography.[39]

*See Chap VIII, p. 222

When UN fighter-bombers attacked a critical target area, they received Sabre cover in the vicinity of the bombing objective. The fighter-bombers were preceded into the target area by a Sabre sweep; when the slower jets arrived about 10 minutes later the Sabres made rendezvous with them over an initial point, after which the Sabre cover orbited at about 20,000 feet, keeping the fighter-bombers always in view during their attack and covering their withdrawal.[40] In the event that a few MIG's broke through the Sabre cover, the fighter-bombers were in no critical danger· the Sabres would have given the alarm and either an F–80 or an F–84 could normally be expected to avoid a MIG–15 at low altitudes and perhaps to shoot him down.[41]

Jet Escort for Conventional Medium Bombers: While the Sabres were successful in covering or escorting most types of UN jet aircraft, neither the F–86's used for top cover or screening nor the F–84's employed in close escort proved able to protect the obsolescent B–29's against attacks by MIG–15 aircraft. Not only were the conventional B–29 bombers slow, vulnerable, and best fitted to operate at altitudes permitting jet escort little advantage, but most medium bomber targets in Korea required no more than 3- or 4-plane formations which lacked the defensive firepower of larger bomber formations.[42] Close-escort duty for the B–29's initially fell to the 27th Fighter-Escort Wing with F–84E type aircraft, and later to the 49th and 136th Fighter-Bomber Wings with the same type aircraft In theoretical and actual performance, the F–84E was a proficient escort for the medium bombers. in Korea it frequently flew 500 miles to escort the bombers, stayed with them for 45 minutes, and then returned to base—no mean feat for a single-engine jet fighter.[43]

Escort tactics utilized by the 27th Wing and later by the 49th Wing were designed to cover the top and tail of the bomber formation. The 27th Wing utilized 8-ship sections, each of two 4-ship flights: one section flew 5,000 to 6,000 feet in advance and 500 to 1,000 feet above the lead bomber to break up head-on attacks; the next fighter section flew approxi-

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mately 2,000 to 3,000 feet above the bombers, a third fighter section of 12 aircraft was positioned 3,500 to 5,000 feet to the rear and approximately 4,000 to 6,000 feet above the bomber formation The 27th Wing anticipated that most MIG attacks would have a large turning radius and a high rate of closure, ultimately ending the pursuit curve somewhere within a 60° cone directly behind the bombers, if the enemy jets were visually detected at a distance of two miles before they reached the bombers they could be successfully thwarted by the rear cover section without commitment of the entire rear cover force.[44] The 49th Wing employed F–84E escort squadrons on the right and left bomber flank, with vertical separation of not less than 4,000 feet above the bombers. Flights of a rear squadron positioned themselves on either side of a 20° tail cone, with approximately 3,000 feet longitudinal separation.[45] An additional high altitude top cover of Sabres sheltered the B–29's and their escorting F–84's.

Although the inferiority of the F–84E to the MIG–15 was soon apparent—a limiting Mach number of .825 put the F–84E at serious disadvantage with the MIG–15 and at altitudes above 20,000 feet it could not hope to turn with a MIG—Thunderjet pilots nevertheless drew upon superior skill to shoot down MIG's, and the 27th Wing was initially confident that it could break up hostile attacks against medium-bomber formations.[46] In the Sinuiju bridge attack of 7 April 1951, escorting F–84's prevented damage to the two B–29 formations bombing, but on 12 April a return raid against the same target met disaster: the bombers were split into three formations, forcing a dispersion of the 48 available F–84's and permitting the enemy pilots to concentrate against the weakest of the three forces Two B–29's were shot down by a MIG force which outnumbered the 14 F–84's escorting the weakest bomber formation by some 3 to 1 The high-cover Sabre force attempted to aid the F–84's, but when they came down in pursuit of MIG's they were fired upon by Thunderjet pilots, to whom all swept-wing fighters looked alike.* After this mission the commander of the 27th Group stated that he considered minimum fighter escort for a single 4-ship box of bombers to be 28 F–84's; for each additional box of 4 bombers added to a formation he wanted a minimum of 8 more escorting F–84's.[47] At this time, however, General Stratemeyer cabled USAF that the F–84E was so outclassed by the superior Mach of the MIG–15 as to allow the latter to carry through their attacks, breaking down and away from the bombers and utilizing their superior speed and climbing power to reposition themselves for additional attacks.[48]

At the end of October 1951 it was apparent that virtually no amount of F–84E escort was enough to protect the slow and vulnerable medium bombers. Able to manage a speed in a slight dive in excess of 95 Mach the MIG's attacked through friendly F–84's, giving only a fleeting opportunity to such Thunderjets as were in position to give chase and utterly denying B–29 gunners time to track and deliver aimed fire.[49] Once again, however, the B–29 force was split up into small bombing formations, and on 23 October it appears that there was some confusion with the Thunderjet pilots as to the direction that the bombers were going to turn off the target, confusion which left some B–29's not adequately protected by escorting fighters.[50]

The loss of five B–29's shot down and eight damaged within one week at the end of October 1951 led to some Fifth Air Force soul searching on the subject of escort. Based upon observations that the F–84E had to operate so close to its Mach limit when engaged in an escort role above 20,000 feet that it could not maneuver to fend off an attacking aircraft and that the MIG–15 and the F–86E were about equal in performance at 25,000 feet, the Fifth Air Force suggested that it might be

*At the high speeds of jet combat, recognition had to be virtually instantaneous. Confused MIG pilots sometimes shot down their own compatriots, and, although the Sabres were distinctively marked, escorting F–84's often found it next to impossible to differentiate in the heat of combat the nationality of swept-wing jets Similarly formations of Sabres were known to initiate attacks on other F–86's before the 4th Wing established procedures for precise radio identification and made all flights aware of the geographical positioning and altitudes of other flights at all times

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practicable to lower the B–29's to 15,000 feet, permitting F–84E and F–86E close and top cover at optimum altitudes. Oval escort was a concomitant to this plan: the close escort was to set up an oblong string of 2- or 4-ship flights directly over the bomber formation, while the middle and high escort established similar patterns in opposite directions. Thus the close and middle escorts would always have flights in position to intercept MIG's approaching either from the front or the rear. Under Korean conditions, the Fifth Air Force nevertheless recognized that its plan had defects: the complexity of identification made it inadvisable to employ Sabres and Thunderjets in the same escorting formation; moreover, once the MIG's attained a position over the bomber force they could be expected to dive through heavy escorting forces.[51] The best employment of Sabres, since it was impracticable to integrate them with Thunderjets, was in a blocking position designed to engage as many enemy fighters as possible before they could reach the bomber stream, but even this screen could be neutralized or circumvented by a superior number of MIG–15's. The 51st Group thought that it might be possible to protect B–29's with a 2 to 1 Sabre-MIG ratio, the Sabres being used in simultaneous escorting, screening, and sweeping forces, but such a number of F–86's was never available in Korea.[52] Apparently there was no ready solution to the problem of escorting the slow and vulnerable B–29's under the conditions prevailing in Korea; at any rate the FEAF Bomber Command evaded the problem by turning to night operations.

PROBLEMS OF THE UN INTERCEPTOR FORCE

Comparative Performance of the MIG–15 with UN Fighters: Through the utilization of well-conceived tactics the UN air arm successfully minimized the threat of the CCAF, despite the fact that, under the conditions of the air war in Korea in 1950–52, the MIG–15 possessed significant advantages over every UN jet fighter except the USAF F–86 Sabre. Fundamentally, the problem of matching UN aircraft in performance with the Soviet-made MIG's in Korea was that the UN aircraft were general purpose fighters which were attempting to give battle with a specialized interceptor under conditions lending every favor to the Communist jet aircraft. Although ventures behind Communist lines in April and July 1951 salvaged nearly all of the remains of a MIG for intelligence analysis,[53] the over-all performance of the MIG–15 had to be judged during the three years of the Korean conflict in the light of its flight record against UN aircraft. These performance observations dictated the modification of USAF aircraft. After the cessation of Korean hostilities, when the USAF secured a late-model MIG–15 (BIS) type aircraft through the defection of a NKAF pilot, detailed flight tests generally confirmed combat reports regarding the performance of the aircraft.*

In combat over Korea the MIG–15 was clearly superior to older UN jet aircraft. Even at an altitude of 10,000 to 20,000 feet, pilots of the 49th Wing in December 1950 estimated that the MIG–15 was 100 to 150 miles per hour faster than their F–80C's and had an estimated climbing advantage of 3,000 to 4,000 feet per minute; all that the F–80C could do better was to turn faster, avoiding damage but being able only with good fortune or exceptional pilotage to damage the speedy enemy

*At 0924 hours on 21 September 1953 a NKAF defector pilot landed his Russian-built MIG–15(BIS), one of the latest types of such planes, on the USAF airfield at Kimpo (K–14) Subsequent flight testing revealed the following desirable features of the aircraft (1) Ability to operate at altitudes above 50,000 feet (2) High rate of climb (3) Rapid horizontal acceleration from relative slow speeds (4) Short turning radius, a feature which the Communist pilots had been reluctant to exploit, probably due to the MIG's poor accelerated-stall characteristics (5) A short take-off and landing distance required

Undesirable features of the MIG–15 were (1) Loss of aircraft control at high Mach numbers (2) Loss of vision due to the formation of ice and moisture on the canopy and windshield, caused by inadequate defrosting (3) Poor lateral-directional stability at high altitudes (4) Low rate of roll (5) Poor aircraft control at high indicated air speeds

The general conclusion of USAF flight test was that "the undesirable features of the aircraft heavily outweigh its good points." (*See* FEAF Intelligence Roundup, No. 145, Dec 1953, pp 27–28)

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jet.[54] An engagement between MIG's and F9F Panther jets from the *Valley Forge* resulted in a MIG claimed as destroyed, but also in a demonstration that the MIG–15 could outclimb, turn inside, accelerate faster, and outdistance a Panther.[55] U.S Navy F2H Banshees made one sweep through MIG Alley in December 1951, but the immediate conclusion was that these Navy planes, operating at maximum range from carriers in the Sea of Japan, could not hazard another such sweep into an area where combat would be at the choice of the faster MIG's.[56] Neither the F–84E nor the British Meteor jets, the latter flown by the RAAF 77 Squadron in a first encounter with MIG's on 25 August 1951, had high enough Mach numbers to meet the enemy interceptors on anywhere near equal terms.[57] The F–86 Sabre was thus the only fighter available to the UN Command which was capable of combat with the MIG–15 on anything approaching equality.

Initially the 4th Fighter-Interceptor Wing took F–86A model aircraft to Korea, a model soon found to be insufficiently powered to exploit fully its airframe design characteristics at altitude.[58] Beginning in July 1951 and continuing slowly on a one-for-one exchange basis, the F–86A's in the 4th Wing were replaced with F–86E type aircraft, the latter type aircraft having power operated controls which made for improved handling at combat speeds of Mach 90 and above but powered by a modification of the same General Electric J–47 engine used by the earlier Sabre.[59] Doubtless the Communists were also modifying their MIG–15's, but in this aircraft they had a simpler problem. The MIG–15 was capable of flight at Mach numbers as high as the F–86, while their structure was so much lighter than that of the F–86 that its ratio of power-to-airframe weight permitted the MIG a superior performance, despite less powerful engines. Under modifications for combat, the USAF tendency was to make heavy aircraft heavier by the addition of more equipment: the F–86E in clean configuration was 565 pounds heavier than the F–86A.[60] Viewing this comparison General Weyland cautioned: "More attention should be paid to keeping the weight of our aircraft to a minimum."[61] General Ferguson noted that the USAF "penchant for gadgetry and the practice of providing alternate systems and electronics instead of mechanical controls has reached a point requiring re-examination."[62]

According to pilot reports, the MIG–15 was generally superior in performance to the F–86E, although modifications to the latter aircraft in the latter half of 1952 would greatly improve its performance. As of the spring of 1952 the following comparisons were applicable: The MIG consistently outclimbed all F–86 models at all altitudes, with its rate-of-climb advantage becoming more apparent with altitude. The MIG's superiority was particularly obvious above 30,000 feet; below 20,000 feet the difference was not nearly so great, but the MIG could still pull away from the F–86 in a sustained climb. It was generally agreed that the MIG could at least initially outaccelerate the F–86 in level, climbing, or diving flights. At altitudes below 20,000 feet the F–86 had a small advantage in level flight speed, but this advantage was reversed in favor of the MIG at higher altitudes. Above 30,000 feet the MIG could pull away from a Sabre and continue accelerating or convert the speed into a climb which was even more effective in leaving the F–86. In all diving maneuvers the MIG had a slight initial advantage because of its superior acceleration, but the F–86, as was natural for a heavier aircraft, had advantages at all altitudes in dives steep enough and long enough to result in airspeeds above .95 indicated Mach. The MIG, however, almost never dived away when chased. The ability of the MIG to convert its speed into a high angle "zoom" climb was outstanding and advantageous at all altitudes. The rate of roll of the MIG and F–86 appeared about equal with perhaps a slight advantage to the F–86. In comparison with the F–86 which only with difficulty could maintain 4-plane flight integrity at 45,000 to 47,000 feet, the MIG's could be held in a 6-plane formation at 50,000 feet or higher.

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Although the MIG was lighter than the Sabre, had greater thrust ratio, a higher rate of climb, more rapid acceleration, more zoom, and an equal or greater top speed than the F–86, the Sabre, oddly enough, proved able to out-turn the MIG at altitudes below 30,000 feet. This was generally believed due to superior pilotability. At 40,000 feet and above the F–86 would stall when trying to turn level with a MIG. In general, the flight performance of the MIG over the F–86 was definite above 35,000 feet, marginal above 25,000 feet, and nil below 20,000 feet.[63]

Improving the Sabre Weapons System: In combat at high speeds aerial victory went to the pilot who made good with one short burst of fire that achieved hits which either destroyed the enemy aircraft or slowed it down sufficiently to permit additional firing. During December 1950 one of the first deficiencies reported against the Sabre was that its pilots reported, and gun-camera film verified, that they were getting a large number of strikes on MIG–15's without destroying or slowing these aircraft. On one occasion an experienced Sabre pilot fired 1,200 rounds at a MIG–15 at estimated ranges as low as 150 to 200 feet, and, although the MIG smoked, it still was able to cross the border under control. It was the opinion of most of the pilots who engaged the MIG's that a more destructive projectile would have enabled them to destroy several of the enemy airplanes otherwise claimed as "probables." [64] Interestingly enough, neither the MIG–15 nor the F–86 weapons system was suited for achieving split-second results at high altitudes. Standard armament for the MIG–15 was two 23-mm. and one 37–mm. forward-firing automatic weapons. A single hit from either type projectile would deadline a fighter for quite some time; in at least one case, a 37-mm. API–T projectile caused so much damage to a Sabre that it had to be salvaged.[65] But this mixed-caliber, low-cyclic-rate armament installation was poorly suited for the snap-shooting of jet air-to-air combat; there were few if any reports of hits scored by MIG–15's on F–86's above 40,000 feet.

With six M–3 .50-caliber machine guns, the Sabres possessed weapons with a high cyclic rate but of small caliber and limited range. At high altitudes, moreover, Sabre pilots noted that incendiary bullets were reduced in effectiveness, probably because of a lack of oxygen to support combustion. In May 1951 explosions caused in blast tubes from firing M–23 incendiary ammunition inflicted major damage on three Sabres and forced the suspension of the use of this most effective high-velocity munition.[66] By June 1951, 4th Wing pilots had destroyed 31 MIG's, but 49 others, damaged generally in tail chases and low angles-off, had flown away. Using .50-caliber M–8 API ammunition, pilots had counted up to 100 hits on single firing passes and yet the MIG had escaped. To ensure destruction, the 4th Group wanted larger guns of 20-mm. caliber, capable of firing explosive ammunition. Pilot opinion favored a six 20-mm. cannon system with the high cyclic rate and dependability of their old .50-caliber machine guns.[67]

Already cognizant that fuel-purging systems and the fleeting opportunities of jet combat demanded harder-hitting aerial weapons, the USAF Directorate of Development had in design a more destructive weapon for day fighters scheduled for 1954–55; as an interim weapons system it had been working for several years on two revolver-type guns based on a German experimental weapon: the T–130, a 15-mm. gun with a cyclic rate of 1,800 rounds per minute and a muzzle velocity of 3,500 feet per second, and the T–160, substantially the same gun in the 20-mm. size.[68] Eight T–160 equipped F–86's would be sent to Korea for combat tests in January 1953,* but meanwhile the Sabre wings used a variety of ammunition loadings in an effort to obtain more lethal qualities. In 1951 alternate loadings of M–8 API and M–1 incendiary proved the best mixture available for use, but there was some indication that heavier proportions of incendiary would give better results.[69] In

*Project GUN VAL will be discussed in AHS–127 USAF Operations in the Korean Conflict, 1 July 1952–27 July 1953 The complete report on this project is APGC Final Report, Project APG/ADA/43–F–1

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May 1952 the 51st Wing used the following standard loading: the top two guns with straight M–1 incendiary, the center two guns with four rounds of M–8 API and one round of M–21 headlight tracer, and the bottom two guns with M–8 API. In general, FEAF agreed that the use of tracer ammunition was detrimental to gunnery training in that it tended to divert a pilot from a proper solution of his gunnery problems with his sighting system, but FEAF nevertheless urged the advisability of using tracer in combat: its use had permitted several MIG kills when sighting systems failed and tracer ammunition also provided a psychological advantage, often causing an enemy to break and allowing the friendly aircraft to close.[70]

Few problems in Sabre combat during 1951 and 1952 were greater than that of the sighting system used in the F–86. The older model F–86A's were equipped with the K–18 sight when they arrived in Korea, but this sight received adverse report during December 1950: its ranging control was much too stiff and erratic, tracking at high indicated airspeeds was difficult, there was excessive movement of the reticle when guns were fired, and a boresight speed of 357 knots was inadequate when the enemy was pursued at indicated speeds of over 500 knots.[71] The F–86E aircraft arrived with J–1 fire-control systems, basically comprising the A–1CM gun-bomb-rocket sight, the AN/APG–30 radar, a range servo, and a power pack. Although in June 1951 the older F–86A's were ordered equipped with the A–1CM and AN/APG–30 radar, both the A–1CM and K–18 sights continued in use during 1951, preventing pilots (who in many cases flew one out of five missions with an A–1CM sight) from concentrating their study enough to master either system in combat.[72] Additionally, the J–1 system was beset with a multitude of maintenance problems, some due to rough runways which jarred delicate electronic components but even more to a dearth of trained personnel and necessary test equipment to keep the system operational. Long-range capabilities of the A–1CM sight, moreover, could not be exploited because of the short-range armament installations on the Sabres. As a result, many pilots favored the clearly inferior but dependable K–18 sight while others "caged" the A–1CM to eliminate radar and gyro inputs and get fixed-sight characteristics.[73] In February 1952 the Fifth Air Force director of operations advised a staff conference that the A–1CM sight was "too complicated to be maintained."[74] As late as April 1952 it was reported that "the majority of F–86E pilots have little faith in the sight as a dependable installation."[75]

General Weyland was nevertheless convinced that the A–1CM sight and its associated equipment had not received a fair trial, and at his request the USAF Air Matériel Command instituted all-out remedial action. At the end of March 1952 the AMC established a remedial project JAYBIRD, which diagnosed the basic A–1CM problem as being a lack of adequate provisioning and the fact that the decision to produce this sight had been a little too soon, considering its state of development. In April a team made up of AMC and Air Training Command personnel, together with civilian technical representatives, went to Korea to remove the old J–1 fire control systems in combat F–86's and install modernized systems. Arrangements were also made with FEAMCOM to modify the old J–1 systems removed from combat Sabres to the new configuration Additional test equipment was brought to Korea and the JAYBIRD project also made arrangement to secure the transfer of test equipment held by the F–84 wings to the Sabre wings. By the end of June 1952 the AMC team had completed its work, and meanwhile the Air Training Command had begun to turn out the necessary technicians to maintain the J–1 system.[76] At the same time the appearance of the "Jenkins Limiter" in Korea promised to decrease sight sensitivity. The A–1CM sight had been designed automatically to compute lead at ranges up to 1,500 yards; while this feature was desirable against slow-moving bomber targets it introduced oversensitivity when the sight was used against a violently maneuvering MIG at closer range; the range limiter, which had been worked out by the Air Proving Ground Command, reduced

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the sensitivity of the sight at long ranges and provided a visual indication to the Sabre pilot when he was within a preselected maximum shooting range.[77]

During the summer of 1952 the problems of the A–1CM gunsight were nearing a fairly satisfactory solution in Korea, but in Washington there was question as to whether such a sighting system should be retained General Vandenberg had queried a group of returned Sabre pilots whose combat tours had coincided with the maximum malfunctions of the A–1CM sight and frankly asked General Weyland to tell him whether such a sighting system should be continued in USAF fighters. The Fifth Air Force accordingly convened a seminar of "aces" from the 4th and 51st Wings on 11 September. Posed with the problem, all of these combat pilots felt that all of the automatic features of the A–1CM gunsight should be retained. It was true that superior pilots with a number of years of fighter experience would probably do as well with a Mark–18 sight, but in any future conflict the burden of air combat would fall on younger pilots who had little or no gunnery training and no time to acquire the experience needed to place them in the superior class. In Korea most MIG kills were obtained from low deflection shots, but all of the pilots thought that this was due to the short-range guns of the Sabre; with improved armament, deflection shots would become more important Many problems had been encountered with the new and complicated A–1CM sight under field conditions, but it was believed that the problems could be solved by redesign of the gunsight to include fast change component parts, the judicious assignment of technical personnel, and an accelerated training program of technicians and pilots. All pilots agreed that the A–1CM gunsight should be retained as standard equipment in the F–86 but recommended an immediate program to redesign the sight with a view toward its increased reliability and ease of maintenance.[78]

"Almost all the experts except those who actually fought here," observed a 4th Fighter-Interceptor Wing study, "looked at everything but the thrust coming out of the tailpipe." What the wing wanted was an ability to match the MIG–15 in climb, ceiling, and top speed: "When a man goes hunting with a gun, he's got to get close enough to whatever he's after with that gun to kill it" [79] On 19 October 1951 Col. Benjamin S. Preston, commander of the 4th Group, reported that his pilots were well pleased with the aircraft performance of the F–86E at very high speeds but they still required more thrust to better the MIG–15 The next day Colonel Preston filed a formal unsatisfactory report on the J–47–GE–13 engine in the F–86A and F–86E series aircraft. The thrust of this engine was insufficient to enable the F–86 to match the combat performance of the MIG–15; Colonel Preston recommended the installation of an engine delivering a minimum of 6,500 to 7,000 pounds of thrust in the F–86 airframe.[80] Already the USAF had developed a J–47–GE–27 engine for its F–86F model aircraft, an engine which surpassed the thrust of the –13 version by more than 700 pounds and developed a maximum of 5,910 pounds of thrust under full military power.[81] Receiving a FEAF indorsement on the 4th Wing recommendation for a more powerful engine, the USAF Directorate of Operations early in December 1951 stated the requirement for a new engine more powerful than the GE–27.[82] Such an engine was put in development for incorporation in the F–86H, which, however, was not scheduled for flight test until March 1953.[83]

Recognizing the impracticability of speeding the development of a substantially new and more powerful engine, the Air Research and Development Command established on 11 January 1952 an A–1 priority program designed to improve Sabre performance. Three practical means of improving an F–86's performance were to be explored: increasing the war emergency thrust available in the GE–13 engine; reduction of the weight of the Sabre; and reduction of the drag of the Sabre.[84]

Improving F–86 performance by weight reduction sounded feasible, but investigation demonstrated that while equipment added to the basic airframe could in most instances be easily removed there was no way to get rid of the extra weight which had been built into

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the airframe to accommodate the added equipment. Engineers of the North American Company drew up a plan to reduce the weight of the Sabre by 2,800 pounds, but such would have been possible only by a virtual redesign of the airframe requiring about as much lead time as the production of an entirely new aircraft. Some progress was made in increasing the thrust of extant Sabres. representatives of the North American Company, who reached Korea in March 1952, demonstrated that a slight readjustment of the nozzle area of the jet engine tailpipe would increase the tailpipe temperature by 70° centigrade and make possible the use of full-rated thrust at altitudes above 35,000 feet. Experiments in over-temperature operations of the F–86 engine, however, showed that such a practice would be so deleterious of the engine that it would be generally impractical in Korea, where logistics support was already marginal. By May 1952 the North American Company had also developed a three-bottle solid propellant rocket unit, each of which was expected to add 1,000 pounds of thrust to the F–86, providing "flash" performance for short bursts of speed either in overtaking or in eluding a MIG Five of these installations, each being designed for external attachment to a Sabre, were shipped to Korea in early August 1952, but by November combat pilots had reported the assembly to be undesirable for combat use. These pilots did not favor the added weight of the installation; the ARDC project officer reported that. "The pilots would rather have a better performing aircraft for an entire mission than wait for the ideal situation, which may never . . . occur" Two other projects were undertaken to secure thrust augmentation through water-alcohol injection and preturbine injection of fuel, the former being already practical for take-offs and the latter promising to create an afterburner effect in the normal combustion chamber of the J–47 engine, but these projects would require long term developmental work [85]

The most significant development on the Sabre which would be of value in time for the Korean operations lay in the reduction of the aircraft's drag. To better its stall characteristics, the Sabre had been designed with a leading-edge wing slot, but North American in 1951 had retrofitted one F–86E with an extended, solid leading edge Colonel John G. Meyer, who had recently returned from command of the 4th Wing, flew this modified Sabre, reporting enthusiastically on its performance late in December 1951.[86] Late in January 1952 test pilots at the Wright Air Development Center flew an F–86 whose slots had been sealed with fabric and dope, giving the effect of a solid leading edge wing. While tests were continuing, the Fifth Air Force on 26 April 1952, signified that it believed that F–86's with leading edge modifications would be highly acceptable.[87] As a result of its favorable tests, the Air Materiel Command ordered 50 modification kits from North American and asked for proposals to incorporate the improvement in current production model F–86's. The modification was extremely simple and inexpensive: in place of the old slots the new solid leading edge extended each wing chord by six inches at the base of the wing and three inches at the wing tip.[88]

When the first four modified leading edge kits were ready, a team from the WADC left for the Far East with them on 28 July 1952. By 18 August the first three kits had been installed on newly arrived F–86F's, and 51st Fighter-Interceptor Wing pilots had taken them into combat. The initial pilot response was enthusiastic, and the project officer later reported that once pilots had flown the modified F–86, they were reluctant to fly the unmodified aircraft At the end of August, FEAF requested the procurement and delivery of sufficient "6 x 3" leading edges to retrofit all F–86E and F86F model aircraft assigned to Fifth Air Force.[89] Not only did the solid leading edges improve the F–86 performance, but with additional developmental work it would be practicable to incorporate integral fuel cells into the leading edges, thereby extending the range of the Sabre. To balance against these advantages were some added handicaps at low altitudes and low speeds: low speed stall became more severe, and stalling speed increased, necessitating a faster approach and a hotter landing. But as one combat pilot com-

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mented, "Since the air war is not won in the traffic pattern these characteristics cause little concern." [90]

The extended leading edges greatly improved the performance of F–86E aircraft but their results were spectacular when they were incorporated on the F–86F aircraft received by the 51st Wing beginning in June 1952 and the 4th Wing beginning in September 1952. Maximum operating altitude for the modified F–86F went immediately up to 52,000 feet, an increase of some 4,000 feet over the ceiling of the earlier Sabre types. The maximum Mach number went to 1.05, and at high altitudes the airplane with the extended leading edge was able to make tighter high-G turns, evidencing a superiority in maneuverability which meant much when thrown into the balance against the highly agile MIG–15. Both rate of climb and top speed in level flight improved, although the former still could not match that of the MIG–15. Drag decreased, permitting higher cruising speeds with no increase in power settings, thus extending the range of the F–86's.[91] Initially the F–86F's were segregated into the 51st Wing's 39th Squadron and the 4th Wing's 335th Squadron, but this combination had to be broken up and the F–86's redistributed throughout the wings because of morale reasons: the 335th Squadron during the period 1 October 1952 to 1 February 1953 scored 31 MIG kills while the other two squadrons in that wing turned in a combined claim of only 54 MIG kills, the difference being attributed "solely to the F–86F type aircraft . . . being flown by the 335th." [92]

Sabre Logistic Support: During 1951–52 the Fifth Air Force Sabre strength was not only short in terms of a growing numerical superiority of CCAF MIG–15's but it was plagued by problems of logistic support. These logistic problems were due in some degree to several unavoidable factors, including: 1) the hurried initial movement to the Far East of a plane type which the USAF possessed in essentially short supply; 2) crude operating facilities in Korea and the necessity for the F–86's to fight at a range which denied them optimum employment; and 3) the many changes made in the F–86 aircraft in the effort to give them performance parity with the Soviet-built jet interceptor. Each of these factors was interrelated and contributed to the major problem, which was that supply support for the F–86's had been provisioned according to the best knowledge available for strictly normal operations whereas in Korea the Sabres operated from crude airfields, with excessive combat loading, and in a condition of less than optimum employment.

The hurried movement of the 4th Fighter-Interceptor Wing from New Castle, Delaware, to the Far East in late November and early December 1950 got it off to a bad logistical start. Due chiefly to an insufficient time for planning and to changing orders during the movement, personnel and aircraft of the 4th Wing reached Johnson Air Base in Japan, while approximately one-fourth of urgently needed maintenance equipment remained on Pacific coast docks, awaiting water transportation. "When organizations are intended to maintain instant mobility," observed the 4th Wing, "separate kits of minimum essential equipment and spares should be kept inviolate, complete, crated, and properly marked." [93] Aircraft of the wing were insufficiently cocooned and shipped to Japan by aircraft carrier and tanker, with the result that 42 of 73 aircraft were corroded by salt spray to some degree; some of these required replacement of trailing wing edges.[94] In Japan most of the 4th Maintenance and Supply Group set up at Johnson Air Base, where it would retain a rear echelon until February 1952, when rear echelon maintenance for F–86's was established at Tsuiki. Combat echelons, comprising initially detachments, then squadrons, and eventually most of the 4th Wing, operated initially from Kimpo, temporarily from Taegu (K–2), built up strength at Suwon (K–13), and finally by the end of 1951 gained a permanent lodging at Kimpo (K–14).

As its combat echelons went into action from Korean airfields, the 4th Wing met logistic and maintenance problems arising from the limited air facilities available in the combat zone, problems which were not unlike those encountered by other Fifth Air Force

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units. The only operational runway available at Suwon (K–13) during the first months that the 4th Wing operated there was of rough concrete, 5,200 feet long, with no overruns and very soft shoulders. Several dips in the runway caused damage to F–86 nose wheels, while the soft shoulders and limited runway clearance caused accidents.[95] Field maintenance shelters were unavailable, and the air conditioned shop building needed for maintenance of the A–1CM gunsight was somewhat out of the question.[96]

From the outset of its Korean operations the 4th Wing met trouble with the external wing fuel tanks which its F–86's had to carry to reach MIG Alley, fight there, and return to base. The distance to MIG Alley was sufficiently far to demand external fuel. And the performance of the MIG–15 was such that an F–86 could not expect to live or to kill if it attempted to give combat while carrying its external tanks: as a result the external fuel tanks had to be jettisoned if there was the slightest possibility of a Sabre's engaging or being engaged by a MIG–15.

During most of 1951 the F–86 wing tank problem had an operational and maintenance context. getting the tanks to release and ensuring that they did not damage the aircraft as they fell. In December 1950, while flying from Kimpo with North American 120-gallon external tanks, 4th Wing pilots attempted to jettison approximately 190 of the tanks, of which 13 tanks failed to release successfully. Percentage-wise the failure was not especially significant, but in one 8-plane mission the tanks of both leaders failed to release when MIG's were sighted below, keeping half the effective F–86 strength out of combat.[97] Although the ratio of malfunctions continued at about the same level the failure of the tanks to release with complete effectiveness adversely affected pilot psychology: pilots were prone to release even before bogie aircraft were identified as hostile.[98] Early in April 1951 the 4th Wing determined that the tanks were failing to release because moisture in the shackle assemblies froze at high altitudes.[99] When the shackles were kept dry some improvement was noted in the malfunction, but moisture could collect while the plane was in flight; one fix was to attach gun heater pads to the shackles, preventing them from freezing at high altitudes, but these heaters were short in USAF supply and critically short in the Far East. A more practical solution recommended by the Air Materiel Command required the removal and cleaning of the shackles, which were then packed with Dow-Corning compound DC–4 to prevent the entry of water By July 1951 the problem of wing tanks failing to release had been almost eliminated by the adjustment of tank shackles and the use of the packing compound.[100] Thereafter there were occasions when tanks were bound by airline fittings after their release, hanging long enough to dent leading edges, damage wing-tips, or break off the pitot booms of the aircraft. Most of such damage, however, was sporadic and due to poor aerodynamic characteristics of tanks, faulty operation of mounting shackles, or binding of fuel and air pressure lines.[101]

The problem of positively jettisoning the F–86 external fuel tanks had hardly been solved before the supply of wing tanks loomed as a problem which would soon reach gigantic proportions. The external fuel tanks originally procured for the F–86's were designed for range-extension on "ferrying" missions, and any large-scale jettisoning of the tanks in combat had not been foreseen. Built to last the lifetime of an aircraft, a pair of tanks cost approximately $1,500. After the 4th Group had expended 324 tanks during the last 15 days of April 1951, its commander recommended that USAF should take steps to secure a cheaper tank, which would also be easily air-transportable and able to withstand rough handling.[102] Aside from the cost of the drop tanks (which eventually became the largest single operating cost of the two F–86 wings) they represented a significant drain upon cargo space when shipped assembled or upon man-hours when it was necessary to assemble knocked-down tanks in the theater. What was even more important in the fall of 1951 was that the MIG's were extending their operations, and more F–86 sorties had to be flown to oppose them. When the 51st Fighter-Inter-

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ceptor Wing received its Sabres, wing tank demands were nearly doubled. By January 1952 the requirements for F–86 wing tanks had jumped approximately 500 per cent in four months, and the theater supply of tanks was nearing exhaustion. That month many of the 4th Wing Sabres flew missions with only one external tank, some of them barely making it back to Kimpo for dead-stick landings. FEAF made arrangements to secure an immediate emergency delivery of 2,000 tanks from the United States by special flights of C–124 aircraft, but the time lag in this delivery was such that the Sabre wings had to cut back their sorties in February 1952. As it was, it was necessary during February to fly tanks literally from the contractor's plant to the combat area, where they were immediately unloaded and installed on fighter aircraft already warmed up and ready for take-off.[103]

After the crisis of January and February 1952, wing tank deficiencies did not again force a curtailment of Sabre operations, and normal waterborne transportation of the tanks was able to catch up with consumption during the period of the emergency airlift. Additional producers were brought into USAF procurement programs both in the United States and Japan, with a reduction in cost of a ZI-procured tank to approximately $457 delivered by ship in Korea.[104] The logistic system in the Far East was expanded to accommodate the tremendous burden of receiving, assembling, and storing the tanks. But there was to be no substitute which could replace the Sabre wing tanks, and supplying these external fuel containers would remain a burdensome expense in funds and labor during the last year of the war.

Due largely to an insufficient initial provisioning of F–86 spare parts and supporting equipment, a provisioning based on peacetime instead of combat rates of consumption, supply support for the Sabres went from bad to worse and hit a nadir at the end of 1951. The situation was aggravated by a long pipeline and distribution problems which caused a slow response to increased consumption rates. Supply support was additionally complicated by a wide variety of Sabre models, the old A, the new A, the E–1, the E–5, and the E–10 being in operation in early 1952.[105] During 1951 the major portion of the 4th Maintenance and Supply Group remained at Johnson Air Base in Japan, where specialized maintenance crews comprising 15 men from each tactical squadron and every available man of the 4th Maintenance Squadron performed the necessary 50- and 100-hour inspections, along with field maintenance, engine build-up, and engine overhaul. This plan was adopted for three main reasons: a critical shortage of parts and spares which made it impossible to establish any respectable supply levels in Korea, the accessibility to FEAMCOM for parts, spares, and reparables, and the need for shops, adequate housing, and equipment which could not be had in the combat zone.[106] In the spring of 1951 efforts were made to establish at Suwon (K–13) a very limited 30-day level of F–86 spares which was supplemented on an emergency basis with supplies dispatched from the main body of the 4th Supply Squadron at Johnson; the poor communications media between the two bases rendered close coordination difficult.[107]

The maintenance and supply organization of the 4th Wing did its utmost to prevent AOCP's and ANCR's: items were hand carried through supply and maintenance shops to expedite the process, continuous surveys were made on critical items by daily contact with the FEAMCOM depot and weekly telecons through the depot to the ZI, every known supply source was utilized including salvage, cannibalization, local manufacture, repeated repair and patching of items which could normally have been salvaged, and contacting other units in the theater for items possibly in common supply. But authorized supply levels did not build up: in early March 1951 a survey revealed less than 60 per cent of established levels on hand for 257 line items checked; in early April a survey of 45 critical items showed less than 10 per cent of established levels on hand with zero balances on most of the items.[108] In July 1951, acute shortages of between 50 and 100 critical items continued to exist. During October 1951 the supply situation was somewhat bettered when the 4th

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M&S Group obtained permission to remove serviceable parts from the F–86A's being returned to the United States, substituting therefor unserviceable parts.[109] The utilization rate of F–86 aircraft nevertheless continued its downward rate, and in January 1952 an average of 45.5 per cent of this type aircraft was out of commission, including 16.6 per cent out of commission for parts and 25.9 per cent for maintenance.[110]

While there was little that could be done in the theater to better the supply situation, some improvements were made in Sabre maintenance. When all second intermediate as well as major inspections were being performed at Johnson Air Base, a considerable amount of time was lost in ferrying aircraft from Kimpo all the way to Johnson Air Base, additional time being lost when the aircraft was grounded by weather either en route or at the Japanese base At the end of 1951 improved base facilities at Kimpo permitted the 4th Wing to effect changes in its maintenance organization, and early in 1952 a series of station changes liquidated the rear echelon at Johnson, sending the portion of the 4th M&S Group that was there to rejoin the wing at Kimpo and moving the 4th Maintenance Squadron to Tsuiki to establish in February a REMCO in cooperation with elements of the 51st Wing. During the course of these changes the second intermediate inspection function was transferred to the forward base at Kimpo, thereby nearly halving the time lost to the necessity of ferrying aircraft to and from the rear echelon. The REMCO at Tsuiki performed only major inspections.[111]

Early in February 1952 a request for information concerning F–86 supply support in the Far East by the House Committee on Armed Services sent an AMC team, headed by Maj Gen. George W. Mundy, to the theater to get first hand information. A team from North American Aviation also surveyed the critical items situation in the Fifth Air Force at about the same time. When General Mundy found some instances of the lack of supply control of F–86 critical items within the theater, General Everest on 13 February ordered the establishment of a common supply office which could maintain a rigid central control and distribution of critical items to the using units at Kimpo, Suwon, and Tsuiki. Base Supply AFSO–4 at Kimpo was accordingly made the supply point for F–86 spares, functioning there until 1 July when the function was moved to Tsuiki to decrease its vulnerability to enemy attack. General Everest also directed that all spare parts for F–86's would be expeditiously transported by airlift.[112] These actions settled what General Mundy called "a minor problem area in the overall picture." The major problem was insufficient provisioning of F–86 spares; a large part of AOCP/ANFE items had been occurring for the first time and were therefore not previously provisioned, or were provisioned in limited quantities based on peacetime flight consumption data. The Mundy team obtained a listing of all critical items, and on 25 March 1952 the AMC established project PETER RABBIT, which had a 30-day objective of purchasing a 360-day level of all critical items of F–86 supply for delivery to FEAF. While the completion date was not met, an augmented flow of supplies was headed to the Far East during the period. Project JOLLY BOY was also initiated on 8 April 1952 by AMC with the purpose of improving the support of ground handling equipment needed by F–86 organizations.[113]

The series of emergency actions and organizational changes resulted in an improving in-commission status of F–86 aircraft. In June 1952 a joint 4th and 51st Wing inspection team determined that the Tsuiki REMCO was "proving the feasibility of its type of operation." And despite heavy operational commitments in May, the percentage of Sabres out of commission during June 1952 had dwindled to 27.8, with an AOCP rate of 3.1 per cent being the smallest figure in this category thus far in the Korean operations of the F–86's.[114]

The Personal Equation in the F–86 Combat Score: During 1951 and much of 1952 the air-to-air war in Korea pitted F–86 Sabres, available in small numbers which were additionally

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reduced by problems of logistics, against a MIG–15 force which was superior in individual aircraft performance and in a numerical strength of planes. The Sabre screen, moreover, was primarily defensive, designed to protect friendly aircraft to the southward rather than to destroy the enemy's air forces. As of 30 June 1952, FEAF had nevertheless destroyed in aerial combat a grand total of 412 enemy planes, 341 of which were MIG–15's, at a cost of 98 USAF planes lost in air-to-air engagements.* The brunt of the air battle against the MIG's had been borne by the Sabres, which had destroyed 309 of the enemy jets at a loss of 43 of their own number. The Sabres had thus effected a kill ratio of a little more than seven to one against the enemy's best jet fighters.[115]

Most of the MIG–15's were shot down in the course of day-to-day patrolling action, and jet air combat over Korea lacked the spectacular "big shoots" of World War II when pilots had sought to destroy the hostile air force. The Sabre pilots, however, revealed that they could handle the enemy air force if its destruction had become their primary objective On the afternoon of 30 November 1951 occurred the closest approximation to a large offensive aerial engagement, when a formation of 31 4th Wing Sabres intercepted a hostile force of 12 TU–2 twin-engine bombers, 16 escorting LA–9's, and 50 covering MIG's on a southerly heading near Sinuiju, evidently en route to bomb Taehwa-do Island in preparation for Communist landings there that night. The Sabres destroyed 8 TU–2 bombers, 3 LA–9 fighters, 1 MIG, and damaged 3 more of the bombers.[116] Such an action was unusual and the bulk of the Sabre combat victories was rolled up at not more than a few on any one day: the best month in terms of MIG's destroyed during the period was April 1952, when 540 were encountered and 44 were destroyed by the Sabres.[117] Aerial combat over Korea nevertheless made new jet aces and allowed older World War II aces to add to their scores. On 20 May 1951, Capt. James Jabara destroyed his fifth and sixth MIG–15, gaining the distinction of becoming the first ace of the Korean conflict and the first known jet ace.[118] At the end of the period, on 15 June 1952, Lt. James F. Low, who had volunteered for pilot training in July 1950 and was only six months out of flying school, became the seventeenth jet ace of the Korean war.[119]

The seven to one ratio of MIG's destroyed to Sabres lost was directly attributable to a superior level of ability prevalent among F–86 pilots and their utilization of tactics permitting the utmost exploitation of the F–86 aircraft The make up of the body of Sabre pilots varied somewhat during the course of the Korean hostilities: it represented professional USAF officers with extensive fighter experience, returned reservist pilots with World War II experience, and finally a new crop of fighter pilot replacements fresh from flying school Many of the pilots were old men by World War II fighter standards. As a general rule, however, the Sabres were flown by men whose ability was high even by USAF standards and very high when related to the probable proficiency of the average fighter pilot who would be available in any large scale war. To the surprise of many persons, the jet fighter experience of Korea showed that the age of a pilot was much less important than his mental attitude, and that the strain of jet air combat upon the physical constitution of a pilot was actually less than that encountered in conventional fighters during World War II. An aggressive, eager, and alert attitude was what was required in a Sabre pilot. According to a 4th Fighter-Interceptor Wing report: [120]

> Air to air fighter flying calls for a pilot with an aggressive, competitive mental attitude. He must be young, mentally Age, as measured in

*Enemy aircraft could be assessed as "destroyed" by wing claims evaluation boards only when 1) enemy aircraft were observed to strike the earth by a second pilot or ground observer, 2) gun camera film showed, or a second member of the flight witnessed aircraft disintegration, shedding of a major component necessary to sustain flight, a persistent fire in the engine or tail section, or pilot bail-out, 3) aircraft observed to explode or burn while on the ground. (*See* FAF Regulation, No 14-4, 22 May 1951.)

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years, is not the criteria for selecting fighter pilots So long as a pilot's reflexes and vision can hold up, and his physical machinery will continue to stand the pace, he can continue active fighter flying providing he started out in fighters

In the final analysis, it was the aggressive, "Every Man a Tiger," esprit of the Sabre fighter pilots which made the difference that mattered in the air-to-air combat between Sabrejets and MIG-15's over North Korea.

NEUTRALIZATION OF ENEMY AIRFIELDS

The Communist Plan for Extending the Air War: That the Chinese Communist Air Force did not successfully utilize its numerical superiority in jet fighters to establish air superiority over North Korea and to extend the air war into UN territory was in good measure attributable to the Sabre force, but the relentless hammering of North Korean airfields by fighter-bombers and especially by B-29 medium bombers must share a large portion of the credit for the maintenance of UN air superiority in North Korea Twice during 1951, once in the spring and again in the autumn, frenzied Communist efforts to provide airfields in North Korea made it obvious that the enemy was bent on extending the range of his Manchurian-based air force

Communist actions clearly revealed that they had a plan for extending the air war during 1951. Their program required them. 1) to increase air efforts over northwest Korea to attain local air superiority; 2) to utilize this local air superiority to cover the construction and rehabilitation of airfields; 3) to base jet fighters on newly operational fields to augment the local air superiority; 4) to move conventional fighters, ground-attack planes, and light bombers into the new airfields; and 5) to challenge UN air superiority over the ground battle area with the forward-based jets and to initiate air strikes against UN ground forces and air installations with the conventional aircraft.[121] This assessment was corroborated by a report of a Communist China Special Aviation Inspection Group which had visited and had attempted to coordinate airfield repair in North Korea during 1951. Blaming the failure of the Chinese ground forces in Korea upon their lack of air power, the group noted that the Chinese strategic air effort had continued nonexistent while the tactical air effort had found "insurmountable drawbacks" The group stated a general rule that MIG-type jet fighters based at Antung could operate only within a combat-radius of 80 miles southward, and this being true, Communist air penetration into the area south of the 38th parallel would require secret bases located immediately north of that latitude.[122]

Communist Airfield Rehabilitation Efforts, March–July 1951: Of some 150 airfields in Korea, approximately half lay in enemy-held territory, and many of these had been used by UN forces during their advance and retreat from North Korea. Chief of the enemy's Korean airfields (see figure 12) were the two facilities at Sinuiju and that at Uiju, all lying along the south bank of the Yalu. Although attacked, these fields were so proximate to the enemy's jet bases at Antung and Ta-tung-kou that they could hardly be kept continuously neutralized; they were at any event a part of the Antung complex and did not appreciably increase the MIG operating radius. Forward of these bases, enemy airfield activity was quiet until mid-March 1951, when, in a spurt of effort which continued for two months, the enemy constructed eight new airfields and carried out extensive rehabilitation at eight other installations. The most advanced of these fields was at Sariwon, while considerable effort went into rehabilitation of the two airfields at Pyongyang Within the city of Pyongyang the Communists tore down buildings to employ 6,400 feet of city street as an airstrip, getting this Pyongyang downtown airfield into operation in May 1951 All of these fields were advanced air bases, providing only essential runways, taxiways, dispersal areas, and revetments for aircraft.[123]

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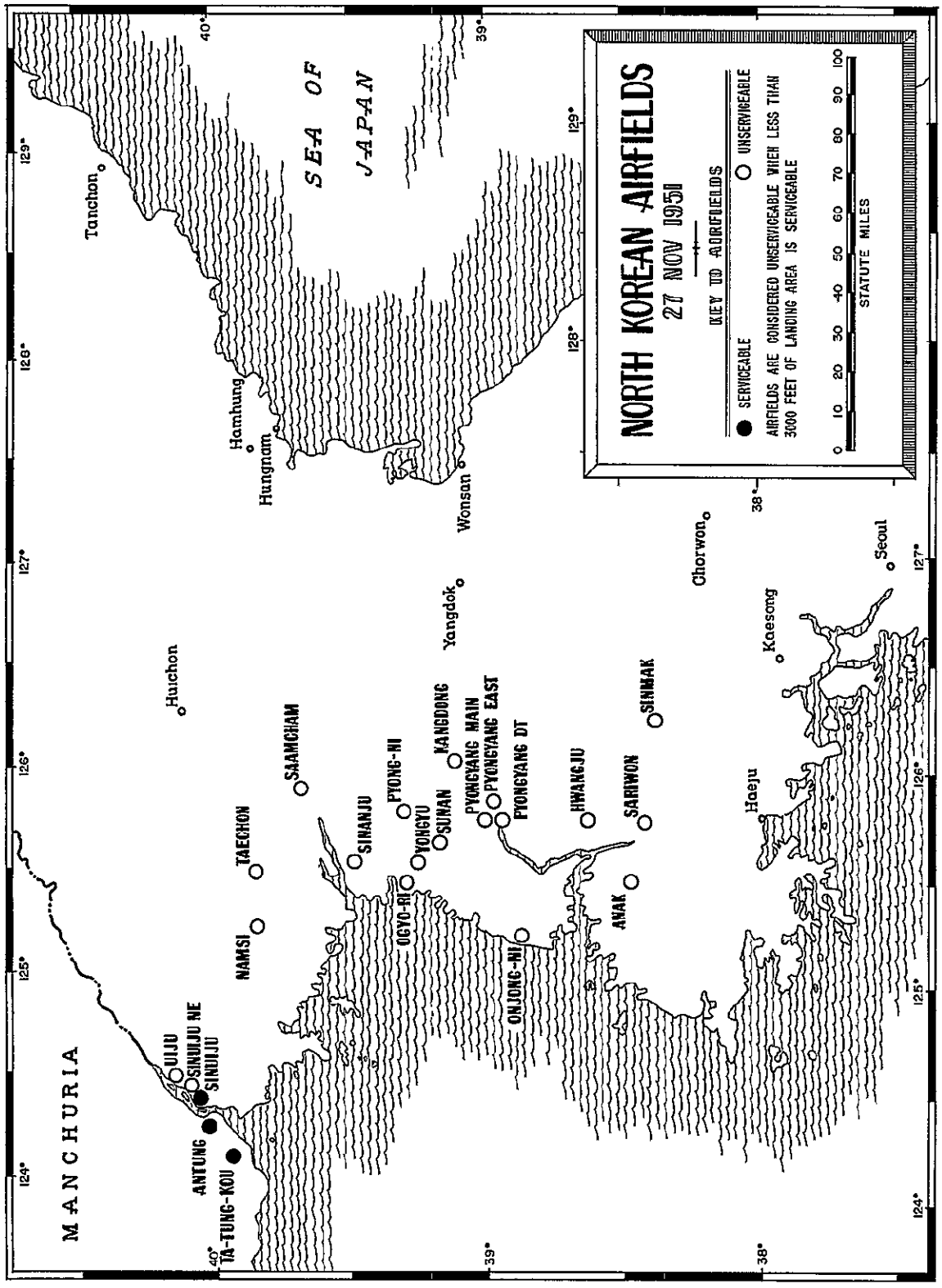


Figure 12

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It was General Weyland's standing policy that enemy airfields in Korea be kept unserviceable as a first priority mission, and by means of periodic photographic reconnaissance flown by the 67th Tactical Reconnaissance Wing,[124] FEAF scheduled attacks so as to keep these airfields out of operations During the last 15 days of April the B–29's bombed the airfields,* and the Fifth Air Force made some efforts to curtail construction by sowing butterfly bombs over the airfields.[125] On 9 May 1951, General Partridge sent over 300 Fifth Air Force, Navy, and Marine fighters to Sinuiju airfield, and while F–86's, F–84's, and F9F's flew cover, F–80's and F–51's destroyed or damaged 38 revetted Communist planes, destroyed 106 buildings, and inflicted large personnel casualties upon demoralized Red airmen, who streamed outdoors and milled around in the open. With the exception of some tight squeezes on fuel, which forced an excessive number of emergency landings at Suwon (K–13), the mission went off without mishap. Although the target was only 10 miles from Antung, the base of an estimated two enemy air regiments, only a few MIG's were sighted airborne and these were easily driven away.[126]

Fighter-bomber attacks continued but in deference to the large-scale Communist effort being exerted, General Weyland in mid-June 1951 directed the FEAF Bomber Command to keep 13 of these airfields neutralized as a first-priority mission.[127] This task was immediately undertaken by the medium bombers and progressed satisfactorily, although at first crews new to Korea apparently had some difficulty in identifying their targets, for most of the airfields blended well with adjacent terrain.[128] About the middle of July 1951 all 13 airfields on Bomber Command's program were either unserviceable or were suitable for Fifth Air Force attack; Bomber Command therefore gave its first priority to attacks on the enemy's communications.[129] At about this time the Communists also seemingly abandoned work on their airfields.[130] Much of this Communist rehabilitation effort was seemingly supervised by the Chinese Special Aviation Inspection Group, whose report dated 1 September 1951 noted with some disgust that their efforts to rehabilitate some 69 airfields had in the end facilitated the operations of only 30 aircraft. Their conclusion was that the rehabilitation of North Korean airfields was a burden far beyond the financial power of Red China.[131]

Communist Efforts to Build MIG Alley Airfields, September–December 1951: The Communists did not give up their intentions of building airfields in North Korea, instead, they devised a plan of great potential hazard to the UN Command. Quite by accident on 25 September 1951 a 67th Wing reconnaissance plane spotted a new runway near Saamcham; its 200 x 7,000 feet of rolled-earth surfacing evidently had been built within three weeks' time and preparations for hard surfacing were already underway.[132] Reconnaissance flown on 14 October showed two other new fields under construction, one just south of Taechon and the other three miles north of Namsi.[133] These three airfields were located within a 20-mile radius just north of the Chongchon River, at the southern end of MIG Alley. Antiaircraft installations served notice that the Reds meant to fight for the fields: 35 heavy guns and 15 automatic weapons were deployed around Taechon, while the other two fields were defended by automatic weapons.[134] The runways were being built in a methodical manner, apparently for heavy use and permanent occupancy; each field was located near a main supply route, evidently to simplify resupply. On 9 November, moreover, reconnaissance revealed that 26 MIG–15's had inched over to base at Uiju airfield, the first enemy jets to be based in North Korea.[135]

There was not much doubt as to what the enemy had in mind. if he could establish these three bases near the Chongchon, he could advance by nearly 100 miles the tactical advantages he held at the Yalu. With MIG's based so far forward, the enemy air could advance the area of "No-man's Air" from the Chongchon to Pyongyang, thereby challenging UN air in the area where the STRANGLE

*See Chap II, pp 60–61

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interdiction attacks* were centered. Concentrated within a 20-mile radius for ease of MIG–15 cover, defended by a growing flak installation, the three fields were not going to be easily destroyed by UN air attack.[136]

As soon as they were located, the new airfields at Saamcham, Taechon, and Namsi were targeted for B–29 attack, both visual and electronic.[137] In deference to generally cloudy seasonal weather in the area, Bomber Command would utilize shoran aiming during daytime bombing. Fighter escort was in order: despite the fact that enemy fighters had not attacked the B–29's since the Yalu bridge raids of April 1951, Bomber Command realized that the enemy would probably react vigorously to strikes against his airfield investment, located as it was, significantly closer to the Yalu than the usual medium-bomber targets of the several previous months. As the Communist airfields were nearing completion, Bomber Command laid on a series of attacks, the first being carried out against Saamcham by a single-plane night shoran mission on 13 October. Four other such efforts were made by 16 October, and on 18 October the 19th Bombardment Group made a 9-plane daylight mission against Saamcham without difficulty. That same day, nine 98th Wing B–29's were scheduled to bomb Taechon, but, failing to pick up fighter escort, they instead struck Sinmak airfield as the secondary target. On 22 October nine 19th Group B–29's drew Taechon as a target, and shortly after they had dropped their bombs, the bombers were attacked by a group of 12 MIG's which dived through the overcast to engage at the same moment that the F–84 escort was drawn off by some 30 other MIG's. One B–29 damaged by MIG fire crashed and burned, but the crew parachuted and was rescued. The following day some 50 MIG's intercepted eight 307th Wing B–29's between their initial point and Namsi airfield; the MIG's first tried to draw off the F–84 escort, but when this was impossible, they launched diving passes through the bomber formation. Although 3 MIG's were destroyed, 3 B–29's were shot down and 5 received major damage as they continued on course to bomb Namsi. The 307th Wing praised the efforts of the F–84 escort but observed that not less than 150 F–86's would have been a minimum escort for the mission.[138]

By the end of October, photos showed all three airfields well cratered, but work was continuing unabated, although the Reds had now devised dummy bomb craters in an effort to deceive reconnaissance as to the true state of repair at the fields. After the disastrous 23 October mission, however, FEAF Bomber Command began shoran-directed night attacks upon the new airfields (following three day attacks against communications targets and the loss of another B–29, the command shifted altogether to night attack), and against this technique the Communists had no immediate countermeasure, although they livened things up with flak, a few night fighters, and searchlights. Operating now without casualties, the medium bombers during November blasted Namsi with 170 tons, Saamcham with 85 tons, and Taechon with 160 tons of bombs.[139] Other airfields drew the same treatment, including Sinuiju and Uiju, where a cratered runway temporarily forced withdrawal of jet aircraft after 11 December. Already on 18 November two 4th Group Sabrejets had dropped down on the deck in an impromptu action at Uiju which strafed and destroyed four MIG's sitting in alert positions at the end of the runway.[140] In December 1951 the Communists once again abandoned any seriously sustained efforts to build or rehabilitate North Korean airfields, although they continued some routine maintenance on the airfields at Uiju, Sinuiju, Pyongyang, and Sariwon. On General Weyland's directive, close surveillance was continuously maintained to determine that enemy airfields in North Korea remained unserviceable.[141]

Lessons of the Airfield Neutralization Effort: The failure of their effort to build and rehabilitate North Korean airfields during 1951 taught the Communists "the basic lesson that an air force cannot be reconstituted or developed in an area where his foe has won air supremacy."[142] By early 1952 the Reds were content

*See Chap V, pp 149–52

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to keep their northernmost airfields in a quickly repairable state, obviously in the expectation of utilizing them to receive air units in the last hours prior to an armistice

The airfield neutralization effort also held lessons for FEAF. It was demonstrated that an airfield did not have to be indiscriminately cratered, through maximum effort, to render it unserviceable. The Communists, when they desired to do so, made use of a seemingly limitless reservoir of coolie labor to repair runways in a matter of hours. Since the time and effort required to repair a runway was not in proportion to the damage rendered, timely and well-coordinated air raids of a modest scale, scheduled as often as photographic reconnaissance indicated that they were needed, paid greater dividends than spasmodic, all-out air attacks against the North Korean airfields.[143]

Neutralization of the North Korean air facilities also held lessons in the need for constant study of target systems in relation to the most effective air weapons capability against them. The Korean war was marked by a great latitude permitted to commanders in the choice of weapons, with the result that airfields, and other targets as well, were often attacked with weapons ranging from 100-pound to 2,000-pound bombs.[144] There was some thought as to the most effective bomb for employment against the North Korean airfields: Fifth Air Force operations analysis in the spring of 1951 made a detailed study of the UN bomb damage to Kimpo Airfield (K–14) This study determined that a typical 500-pound GP bomb crater on the runway at Kimpo was 35 feet in diameter and 8 to 10 feet deep, while a 100-pound GP bomb crater was 25 feet in diameter and approximately 7 feet deep The conclusion was that five 100-pound bombs would provide a total crater area 2.5 times as large as a single 500-pound bomb, provided they were fuzed to explode at a depth of 10 feet.[145] It was already generally accepted that 100-pound ordnance was most useful against a typical airfield target which consisted not only of runways and taxiways but parked aircraft, buildings, and personnel, and the finding at Kimpo in favor of 100-pound bombs against runways evidently pleased the FEAF Bomber Command for its B–29's could load more of these bombs and get a better pattern with them than with heavier ordnance. At any rate, Bomber Command habitually utilized 100-pound GP bombs in its attacks against North Korean airfields. Later experience, however, showed that what had been true at Kimpo, a fairly well-built airfield by USAF standards, was entirely different at the majority of North Korean airfields which had been hurriedly built during the early months of the Korean conflict with little regard to efficient drainage systems. Most of these fields were laid out on low, flat land bordering rivers and had extremely high water-tables, and as a result a 500- or a 1,000-pound bomb would almost invariably penetrate deeply enough to fill with water while the usual 100-pound bomb crater remained dry and was easily filled. While the Communists repaired small, dry craters with obvious facility, Fifth Air Force intelligence noted that in many cases only a single strike with heavier ordnance and resultant water-filled craters was sufficient to discourage attempts at rehabilitation.[146] While the evidence is probably not sufficient to justify conclusions as to what type of bomb would have been most effective against North Korean runways, it is sufficient to indicate that there is need for continuous vulnerability study permitting valid recommendations for the best utilization of air weapons against varied targets.[147]

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THE AIR DEFENSE OF SOUTH KOREA

Limited Air Defense Measures: While the air defense system for Japan was in being at the beginning of Korean hostilities and was subsequently augmented as the world situation worsened, the North Korean Air Force was so quickly destroyed by UN air that there was little threat of hostile air attack in Korea. Not until the appearance of the Chinese Communist Air Force brought a danger of enemy air assault did Fifth Air Force establish a directorate of air defense on 12 December 1950.[148] And not for several months thereafter were aircraft warning services, fighter-interceptors, and antiaircraft welded into an effective defense system.

In the spring of 1951 a fear that the Communists might launch an all-out air assault in coordination with their ground offensives lent some urgency to the establishment of a Korean air defense organization. This danger, added to mounting world tension, caused General Partridge on 31 March 1951 to order the implementation of such aircraft dispersal and defense measures as would not seriously hamper offensive air operations.[149] Prior to March 1951 the TADC's of the 502d Tactical Control Group had been utilized to provide some local early warning services; in this month, however, Fifth Air Force required that all aircraft returning southward from night missions would report to the 606th Aircraft Control and Warning Squadron's TADC GREENHORN. The order was that the TADC would be contacted as an aircraft crossed the line Sariwon through Pyongyang, identification would be by IFF if the plane were so equipped, voice code, or authentication maneuver.[150] In April the early warning system was further formalized when aircraft returning from the target area were required to check in at three different specific points and altitudes by reporting to the TADC's at Pyongtaek, Yoju, and Taegu At the same time a different procedure was devised for reporting traffic to the TACC: all light-weight early warning radars reported to their parent TADC, whose duty it became to filter and identify the traffic and to report only plane tracks which could not be identified to the TACC. During the latter part of April approximately 10 aircraft were put on strip alert at 5 airfields in South Korea, in addition, night fighters at Pusan (K–1), Taegu (K–2), and Suwon (K–13) could be scrambled by the JOC if interceptions appeared necessary.[151]

Hardly was this system functioning when FEAF imposed a necessary but undoubted complication: effective on 3 May 1951 it eliminated IFF as a means of identifying friendly aircraft. The decision was doubtless proper, because the Mark III IFF equipment had been delivered to the USSR in some quantity during World War II and there was always the possibility that the enemy might utilize the equipment to mask a surprise air attack; while only 48 per cent of FEAF aircraft were equipped with such sets, it was obvious that Korean controllers were automatically identifying any aircraft showing IFF as friendly FEAF feared that such reliance on a compromised device might lead to utter confusion and disorganization in the event of a sudden enemy air attack.[152] The decision stood despite its unpopularity in the 502d Tactical Control Group and 314th Air Division, unpopularity arising from a belief that frequent changes of IFF coding could prevent the enemy's successful use of the equipment.[153] With the discontinuance of Mark III IFF for anything more than navigational assistance, aircraft identification was accomplished by air traffic control, position reports, flight plans, movement control, and voice authentication.[154]

Communist Night Heckling Air Attacks: The Communist spring offensives of 1951 had materialized no all-out Red air assault, and UN troops in Korea were returning to complacency about the possibility of enemy air raids when the Communists in June 1951 began a series of small night heckling raids which would prove to be "a small but very antagonizing thorn in the side of the United Nations forces."[155] On 9 and 11 June the U.S. 24th and ROK 5th Divisions were sub-

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jected to light bombing attacks, and then on 14 and 17 June single light PO–2 biplanes made night bombing attacks against Suwon (K–13) airfield The first of these latter two raids wounded one aviation engineer slightly, but the second scored a direct hit on the parking ramp of the 335th Fighter-Interceptor Squadron, destroying one Sabre, seriously damaging four, and putting minor fragmentation holes in four others One of the 44-pound bombs dropped in this attack narrowly missed the 335th's billeting area, where it might have done great damage; instead only four airmen, two officers, and a civilian were wounded [156] After these beginnings, other light enemy planes heckled Seoul, Inchon, and Kimpo airfield (K–14) in almost nightly raids

During World War II Russian pilots had extensively used the small training biplane called the PO–2 for low-level sneak attacks, gliding the little open two-seater into the target area to drop two to four externally-attached, small antipersonnel bombs [157] Employing these same tactics, North Korean pilots proved that the PO–2 nuisance was most difficult to combat. Because of their limited radius the PO–2's had to be based within 180 nautical miles of the Seoul area—Sariwon was later established as their base—but the small planes could operate from almost any small plot of flat ground and could be easily concealed by day.[158] Flying low down moon-illuminated valleys, the PO–2's did not appear on the 606th AC&W Squadron's radar scopes until they were about 12 miles north of Seoul, and even then the wood frame and fabric covering of the plane offered a poor reflecting surface. Even when the raider was located and a night fighter of the 68th Fighter-Interceptor Squadron (which kept two F–82's on strip alert nightly at Kimpo) or of VMF(N)–513 was vectored to an interception, the 80 to 90 miles per hour speed and extreme maneuverability of the PO–2 often allowed it to escape. Marine night fighters on occasion nearly rammed the small planes and still could not pick them up on efficiently operating airborne radar scopes.[159]

Nevertheless, the Red raiders did not always escape· the first kill came on 23 June when an 8th Squadron B–26, slowed down with full flaps, wheels down, bomb-bay doors open, and cowl flaps cracked, scored with a 90° deflection shot. On 1 and 9 July, Marine F7F and F4U night fighters, similarly throttled down, destroyed two more of the planes.[160] Fifth Air Force operations got four T–6's equipped with .30-caliber machine guns to operate under GCA control, against the PO–2's [161] but the destruction of three of the Red planes, combined with unfavorable flying weather and the current UN neutralization of North Korean airfields, temporarily halted the attacks early in July 1951. The heckling attacks, however, would begin again in August 1951 and would be continued by the North Koreans throughout the remainder of the Korean hostilities

Revamping the Air Defenses of South Korea: The immediate results of the red alerts at Seoul, Kimpo, and Suwon were to cause a loss of sleep, encourage the digging of slit trenches and preparation of limited dispersals, and to hinder the nightly airlift of supplies. A more significant result was the revamping of the Korean air defense system effective 25 July 1951. Already, in early June, the TADC of the 606th AC&W Squadron had deployed forward to a site just north of Kimpo, while the TACC and 502d Group accompanied the movement of Fifth Air Force headquarters to Seoul at the middle of the month. The 25 July reorganization thus divided South Korea into four air defense sectors in which over-all control was exercised by the TACC but local control by a TADC. The three northern sectors were assigned to the TADC's of the 502d Group; the sector covering the southern portion of Korea was assigned to a TADC manned by the 1st Marine Air Wing. Control of AA units and night fighters in each sector was vested in the local TADC. In an effort to get better identification, the Fifth Air Force designated two air corridors for the use of traffic reporting in and out of enemy territory. Under this arrangement the 607th Squadron's TADC handled most identification and MPQ

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bombing, leaving the other two forward TADC's more time for GCI work. Identification was simplified in these free areas in that the TADC's might disregard northbound aircraft if there was nothing to indicate they were unfriendly.[162]

These procedures were adequately justified by the growing Communist air order of battle in Manchuria and their demonstrated ability to operate at night, but identification continued to be burdensome. In August enemy light aircraft entered the Seoul area often enough to stir up the air defenses, and, lacking electronic identification, the TADC DENTIST called 272 day and night fighter scrambles with 260 completed interceptions, almost always of friendly aircraft, during the month.[163] While most of the "Bed Check Charlie" hecklers either did not attack or else did no damage, one of them on 23 September succeeded in dropping two 44-pound bombs at Kimpo, causing very minor damage to two F–86's. As he left the AA defended zone, however, this PO–2 was shot down by a waiting Marine F7F. Violations of the neutral Kaesong air space brought more stringent night control measures in September, whereby corridors were set up from operational bases north to a line at 38°30′, and all aircraft flying at night when south of this line were required to remain under control of the TADC's at Yoju or Kimpo.[164]

In August and September the Fifth Air Force finished planning for a general reshuffling of surveillance radars designed to extend GCI coverage and to redistribute the sectors of responsibility along more logical and easily defined boundaries The plan, as put into effect in October and November 1951, moved the 608th AC&W Squadron (the 6123d was so redesignated on 2 November 1951) TADC from Taegu to a site near the east coast at Kangnung. The Marine TACC moved from Pusan to Pohang, while the Marine TADC went from Pusan to Kunsan, where for the first time it provided Kunsan airfield (K–8) with needed GCI protection. The Fifth Air Force was quite anxious to establish a TADC at a suitable site found on Paengyang-do Island, where it could provide good coverage of the western end of the battle line; but a compromise arrangement was worked out when the 502d Group objected that logistical support there would be impracticable: a lightweight radar was instead located on this island. When no suitable island site could be found, the 607th Squadron's TADC was directed to move from Yoju to a site on a mountain north of Seoul, where it would survey the traffic within 80 to 100 miles, while the 606th's TADC at Kimpo operated with a delayed sweep to survey longer-range plots.[165] Although the 607th Squadron would not complete its movement until March 1952, Fifth Air Force instituted the new air defense system on 15 November 1951. Korea was divided into two air defense sectors, the northern under the 502d Group and the southern under the 1st Marine Air Wing. Two air defense subsectors were established in the northern sector, the northwest under the 606th Squadron and the northeast under the 608th Squadron. Similar southwest and southeast subsectors were provided radar coverage by Marine GCI Squadrons 1 and 3. The subsector TADC's performed surveillance, plotting, and identification functions and cross-told information on aircraft entering adjacent air defense subsectors. They passed plots on all unidentified air targets to their parent TACC's at Seoul or Pohang, scrambled allocated interceptors to identify and intercept unidentified aircraft, and controlled the firing status of local antiaircraft artillery.[166]

Meanwhile FEAF had been urgently requesting permission to utilize the new type Mark X IFF equipment in Korea, its most telling argument in favor of the employment of the new system being that two Navy aircraft had already been lost in enemy territory with the equipment aboard. Since Mark X could be presumed to have been physically compromised, the U.S. Joint Communications-Electronics Committee authorized its use by FEAF early in September 1951.[167] Effective on 15 November, FEAF once again permitted the interim use of Mark III IFF, greatly simplifying identification of those aircraft so

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equipped.[168] Without great delay, AN/GPX–13 Mark X IFF interrogators were installed at the ground radars, but the installation of IFF responders of Mark X type in aircraft required many months In April 1952 less than 50 per cent of naval aircraft operating on the east coast and none on the west coast had Mark X responders; rather than continuing to assume that certain aircraft of a given speed and location were friendly, the Fifth Air Force effected special reporting channels for Navy planes entering Korea.[169] The new equipment added to the proficiency of the air defense system, and several times the Mark X radar proved its worth by permitting instant location of distressed aircraft.[170]

In the spring of 1952 an additional forward deployment of radar occurred which would soon prove to be of great value to the interception of hostile aircraft flying over North Korea Following several months' indecision as to the security of the area, an SCR–270 radar detachment of the 606th Squadron was located at Cho-do Island, where it was able to maintain surveillance over the northern portion of Korea and in many cases to observe enemy aircraft taking off from bases in Manchuria.[171] Acting on information from this early warning radar, GCI controllers at the 606th's TADC DENTIST had good success during May and June 1952 in scrambling F–86's to intercept MIG–15's over North Korea.[172]

At the end of 1951 increasing enemy air threats led the Fifth Air Force to review its air and artillery potential of use to air defense Despite the interception and destruction of the eight TU–2 bombers on 30 November, an earlier formation attack against UN-held Taehwa-do Island on 6 November had shown that at least one Chinese light bomber regiment was operational and, with MIG–15 cover in relays, might attack UN bases in South Korea.[173] The appearance of single high-flying MIG's over Seoul on 3 and 8 December 1951 led General Everest to warn all his commanders to take passive defense measures At this time General Weyland informed USAF that "Present nite fighters in Korea limited to six F–82's and depleted squadron Marine F7F's."[174] Additionally, an average of 45 fighters maintained dawn readiness alert and 30 kept evening alert at the various bases in Korea.[175] Early in December, General Everest managed to secure two F–94 all-weather interceptors from the 68th Fighter-Interceptor Squadron for station at Suwon (K–13); these new jets came over with a prohibition against their use in MIG Alley or any other enemy area where their electronic equipment would be unusually susceptible to loss or compromise.[176]

While their activities were of far less serious portent than was the increasing employment and training of the Communists in night flight and night jet interception, the renewed raids of the PO–2 hecklers in December lent further urgency to the air defense situation On the night of 28 December a PO–2 "very light bomber" again appeared in the Seoul area, marking a renewal of the limited campaign which the enemy had suspended on 27 September. In the early morning of 1 January 1952 an unidentified aircraft dropped seven bombs, one a dud, damaging a few auxiliary fuel tanks at Kimpo.[177] These heckling raids were to remain a costly nuisance, which by April 1952 had destroyed 1 F–86 and damaged 11 F–86's, 1 C–47, 1 C–54, and 6 F–51's.[178]

Since the Communist night air activities in Korea appeared to be in danger of getting out of hand, the 319th Fighter-Interceptor Squadron, equipped with F–94 all-weather fighters, was dispatched to FEAF from McChord AFB in February 1952, and was further assigned to the Fifth Air Force with station at Suwon (K–13). Getting into operation on 22 March, this squadron brought the F–94B strength in Korea to 25 aircraft, and for the first time gave Fifth Air Force a full squadron of all-weather interceptors to help counter any air offensive launched by the enemy under cover of darkness.[179]

Antiaircraft Artillery Defense of Korean Bases: Antiaircraft artillery defenses of vital areas in Korea remained relatively weak, despite efforts of the Fifth Air Force to improve the situation. On 1 June 1951 the strength of AA in Korea was 10 automatic-weapons bat-

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teries and 2 gun battalions, exclusive of AA units organic to Eighth Army divisions. Providing defense against high-level air attacks, the gun batteries were divided among Pusan, Inchon, and Seoul; automatic weapons, chiefly of value against low-level air attacks, covered the airfields then in use in Korea. Because of the air wing buildup in Korea which was underway, General Timberlake on 1 June 1951 indicated a minimum requirement for 20 automatic-weapons batteries and 3 gun battalions. General Timberlake calculated that each Korean airfield should ordinarily be protected by two automatic-weapons batteries, a minimum considering the fact that two tactical wings would be jammed into limited dispersals at most of these airfields [180] By October 1951 increased enemy air activity had caused the Fifth Air Force to increase its minimum requirements for AA to 35 automatic-weapons batteries and 5 gun battalions. Augmented gun strength was needed at Pusan and Inchon, the two major supply ports for Korea, at Kimpo, and at Seoul. Several automatic-weapons detachments were now required for service at isolated radar sites and there was need for a minimum of two and a maximum of four automatic-weapons batteries at each Korean airfield [181]

Although some additional antiaircraft units were obtained, in no case was the actual requirements for them met completely. In July 1951, General Weyland secured five automatic-weapons batteries for transfer to Korea, and the arrival of the 1st AAA Marine Gun Battalion at Pusan in September permitted the desired movement of three gun batteries to Seoul during the high water period at the Han River crossings and then to the higher-priority Inchon-Kimpo area.[182] By the end of 1951 arrival of a National Guard gun battalion, which was split between Pusan and Inchon, and the activation of one additional automatic-weapons battery in Korea brought the effective AA strength to 16 gun batteries and 16 automatic-weapons batteries.[183] No additional AA units having become available by June 1952, an Eighth Army-Fifth Air Force agreement was effected looking toward the concentration of the existing strength according to a priority list The first five potential targets which would be protected were: Kimpo airfield (K–14), Sumon airfield (K–13), the Pusan complex, Inchon harbor, and Kunsan airfield (K–8). This agreement marked the first time that Korean airfields had been accorded higher priority than the two major ports, and, as a result, major concentrations of heavy gun batteries were moved to Kimpo and Suwon, although Inchon retained two gun batteries and Pusan continued defended by two gun batteries plus the 1st AAA Marine Gun Battalion.[184]

With the exception of the Marine gun battalion, the AA units in Korea were assigned to Eighth Army but attached to the operational control of Fifth Air Force, whose commanding general was the air defense commander for the Korea Air Defense Area. Operational control of the 1st AAA Marine Gun Battalion was exercised by the 1st Marine Air Wing commanding general, who was delegated the responsibility of conducting the air defense of the Southern Air Defense Sector. Fire-control status of AA guns was vested in the TADC of the air defense subsector, although the senior USAF officer on duty at the JOC had final control authority and could order changes in the control conditions announced by the local TADC. There were three control conditions· release fire, under which AA could engage aircraft not recognized as friendly or aircraft designated by the TADC controller; limit fire, in which AA units could engage only aircraft recognized as hostile or seen attacking friendly troops or installations; and hold fire, whereby AA units could not fire under any circumstances.[185]

Few of the AA units in Korea ever marked hostile targets, with the notable exception of the automatic-weapons batteries at Seoul, Inchon, and Suwon where the crews had a good amount of practice against low-flying PO–2's, only to find them an elusive target. At Suwon and Kimpo 60-inch searchlights were installed to pinpoint targets for weapons crews and to overcome the blinding muzzle flashes of their weapons. During a part of

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the period at Suwon the 4th Fighter-Interceptor Wing apparently effected exceptional air defense measures whereby the local GCA was given the task of searching out enemy raiders; all unidentified aircraft were reported to the Suwon control tower for air traffic control (MATCON) identification, and if such were not forthcoming, the GCA alerted searchlight and gun crews.[186] Ordinarily, however, these matters were for TADC control After increasing practice the AA at Inchon brought down a PO-2 on 2 October 1951, the fifth of this type to be destroyed and the first by antiaircraft artillery fire [187]

The Status of Korean Air Defenses in the Spring of 1952: By the spring of 1952 Korean air defenses were greatly improved, but in February the Fifth Air Force director of operations furnished the following statement of progress: [188]

> Shortages in AAA weapons, deficiencies in available radar equipment, limitations in the number of aircraft and aircrews detailed to air defense duties, lack of sufficient dispersal space at our overcrowded air bases, the incompleteness of the Mark X IFF program, and the normal passive resistance to defensive measures after prolonged freedom from enemy attack, finds both Air Force and other installations vulnerable to enemy air attack.

A part of these conditions would be greatly improved by June 1952, and a growing awareness of the menace of Communist air attack would result in improved Korean air defenses in the remaining months of the Korean conflict.

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Chapter V

AIR INTERDICTION OPERATIONS

As the ground war along the 38th Parallel approached a stalemate and the peace talks were about to begin at Kaesong, the Far East Air Forces possessed a unique opportunity, as General Weyland expressed it, to demonstrate "the innumerable advantages of air power as a predominant weapon for destroying the enemy fighting machine." [1] Acting in conjunction with UN ground forces, FEAF had contributed greatly to the achievement of a series of land victories; no less an authority than the chief Communist delegate, General Nam Il, testified to this contribution but not without the usual Communist vituperation. "It is only by relying on indiscriminate and inhuman bombing and bombardment by your air and naval forces in violation of the international law," he said at Kaesong, "that the present position of your ground forces are barely and temporarily maintained. Without such cover and support of indiscriminate bombing and bombardment the ground forces would long since have withdrawn to no one knows where." [2]

But now the United Nations desired no more ground campaigns, and the question confronting FEAF commanders and planners in July 1951 was the determination of strategy for an air campaign against the Communist aggressor in North Korea. Air doctrine did not comprehend the situation at hand. A properly conceived strategic air campaign would have destroyed the hostile nation's industrial potential and will to wage war; but in Korea the Communist armies drew their sustenance from areas beyond the Manchurian and Siberian borders, areas which because of political reasons could not be attacked by UN aircraft. Major targets remained in Korea, but most of these major targets—such as the Yalu River hydroelectric plants—were politically sensitive. As a manifestation of unrelenting air pressure in late July 1951, FEAF especially wanted to issue preliminary warning to civilians and then launch a devastating air blow against the North Korean capital, Pyongyang. The JCS, however, while quite willing to permit unpublicized precision attacks, disliked the "mass" nature of the planned assault and thought that to single out Pyongyang for such might make it appear that the UN desired to terminate truce negotiations just as they were getting started.[3] There were so many legitimate military targets at Pyongyang that FEAF nevertheless scheduled its entire capability against them, and on 30 July 354 fighter-bombers attacked through lowering weather which diverted planned B–29 raids that night. No psychological advantage was obtained: the FEAF press release merely noted that its warplanes "continued to batter the enemy's supply and communications facilities." [4]

Doctrines for the tactical employment of air power now held no precise message for Korean air planners. UN ground forces wanted a substantial portion of available air effort in close support, and such support was generously provided when ground units were actively engaged,* but General Weyland recognized that it would be "sheer folly" to use expensive air power against dug-in troop positions as a substitute for artillery.[5] Maintenance of UN air superiority was necessarily

*See Chap. VII, pp 186, 205.

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limited to combat over MIG Alley and neutralization of sporadic Communist airfield construction within North Korea, neither of which activities could occupy more than a part of the UN air force Of the three tasks of tactical air power, only that of interdiction, whereby enemy men and materiel are destroyed and supply routes are severed beyond the battle zones, offered under the existing situation and policies dictated for the conduct of the truce talks any potentially profitable employment for UN air power.

Not only was interdiction the sole employment permitted to the UN air forces at the outset of truce negotiations, but if the UNC estimate of the ground situation was correct, interdiction promised some positive results. During the first two weeks of July 1951 the Eighth Army calculated that the Reds were stockpiling daily 800 tons of supplies behind their front lines; if such activity went unchecked Eighth Army feared that the enemy would "reach a degree of preparedness previously unparalleled in the Korean war." [6] On 7 August General Ridgway informed the JCS that the Communists were capable of launching limited attacks to gain local advantages and of expanding such piecemeal efforts rapidly into a general offensive at a time suiting their purpose.[7] These estimates that the Communist armies were not in fact defeated but were instead utilizing the truce negotiations to prepare for a major ground offensive were generally accepted by the UNC, "deeply concerned" the JCS,[8] and were more than a little convincing to many FEAF officers Thus on 13 July 1951 FEAF directed its subordinates to "step up tempo of fighter and light bomber activities . with emphasis on vehicular movements and pre-planned targets of known enemy troops, supplies, or installations" [9] Beginning on 18 August 1951 FEAF implemented a comprehensive interdiction campaign against North Korean railways designed "to interfere with and disrupt the enemy's lines of communication to such an extent that he will be unable to contain a determined offensive by friendly forces or be unable to mount a sustained major offensive himself." [10]

From the outset USAF leaders had misgivings regarding any air interdiction campaign under the circumstances which accompanied the Korean truce negotiations. In the first place the UNC assumption that the Red armies meant to replenish and launch another all-out ground offensive was doubtful Air interdiction, moreover, had always been keyed to a ground war of movement, and no additional ground campaigns were planned for the UN forces in Korea. "In a long term war," General Weyland had stated in December 1950, "I would say that tactical air power will contribute more to the success of the Ground Forces and to the over-all mission of a theater commander through a well planned interdiction campaign than by any other mission short of the attainment of air superiority." Such a judgment, Weyland immediately added, assumed that friendly ground troops were in active combat on nearly equal terms with the enemy.[11] During World War II the value of comprehensive interdiction programs had been well demonstrated during the Allied invasion of Normandy and the battles of France, when air attacks against railway lines and bridges had prevented the marshaling of German strength upon the battlefields But, as General Vandenberg emphasized, the strategic background for a comprehensive interdiction program in Korea was quite dissimilar to interdiction operations of World War II. In Europe interdiction campaigns to the rear of the German armies had always been in combinations with the forward surge of Allied ground troops, thus catching the enemy where he could neither resupply his battle expenditures nor reinforce himself In Korea the ground front was stabilized and interdiction could only hinder a major enemy offensive by delaying the movement of materiel and personnel to the front. General Vandenberg warned that it would be "scarcely possible to bring about a complete collapse of the Chinese army by such a process of delay." [12]

During earlier Korean operations FEAF airmen had already utilized limited interdiction with great success; during the summer of 1951 they experimented further with interdiction techniques and completed some unfinished

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business against the virgin supply target at Rashin, and finally on 18 August 1951 they initiated against North Korean rail lines all-out attacks designed to delay and disrupt logistic support of front-line Communist ground troops.

KOREAN EXPERIENCE IN LIMITED INTERDICTION

Korean Interdiction Prior to Kaesong: In Korea during the crisis of UN withdrawals in the summer of 1950, the demonstrated wisdom of a comprehensive interdiction effort had been initially ignored by harried ground commanders who wished air power used primarily for close support Not until August 1950 had General Weyland been able to secure the release of a part of the FEAF medium bomber force from close support for a limited interdiction effort designed only to destroy some 60 rail and highway bridges to the north of Seoul. A second interdiction plan, approved early in October 1950 in preparation for the Eighth Army drive into North Korea, had ordered the destruction of 33 key bridges north of the Pyongyang-Wonsan line. The rapid advance of UN ground forces soon necessitated a third interdiction plan, laying on B–29 strikes against 34 bridges on the main east and west coast transportation routes

Such destruction of a few key bridges at no time completely severed North Korean supply routes, but it did have a decisive effect in reducing the amount of materiel transported to enemy forces at the front lines In the final phase of the conflict with the NKPA it also prevented an organized retreat and regrouping of Red forces short of the Manchurian border. Limited in force employment generally to the medium bombers, these three early interdiction campaigns were also limited in concept. Fundamental among such limitations was the restriction against violation of the Manchurian border, a restriction which not only prevented a progressively deeper interdiction as ground troops advanced northward but greatly hampered the medium bomber attempts to destroy the Yalu River bridges. General Weyland believed that a proper interdiction program should have included both fighter-bomber and light and medium bombardment attacks,[13] but only a part of the medium bomber force had been available to make attacks against only one segment of the enemy's transportation network—his key bridges and a few marshaling yards.

During the critical days of the UN retreat from the Yalu in December 1950, FEAF target-intelligence officers worked out a fourth interdiction program, designed to cut the Communist rail system in North Korea into segments no longer than 30 miles in length. As announced by FEAF on 13 December, this plan divided Korea north of 37° latitude into 10 zones, generally following the main transportation routes. A total of 172 separate targets was given, selected and numbered "on the basis of greatest effectiveness for LOC interdiction." NAVFE assumed responsibility for three of these zones, generally covering the area running northward from Wonsan to the Siberian border. This interdiction program was prosecuted by the FEAF Bomber Command, with diversions to other more pressing ground support, and the Navy got an intensive application of effort underway in its zones in March 1951, but most Fifth Air Force capability had to be placed upon close support and armed reconnaissance during the Communist ground offensives of the spring of 1951.[14] Thus before the summer of 1951 no comprehensive interdiction plan against Communist movement had been effected in Korea.

Medium Bomber Techniques: During 1950 the B–29 medium bombers of the FEAF Bomber Command had been remarkably successful against ordinary-type Korean bridges, but the mission became progressively more difficult during 1951 The advent of heavy enemy flak and fighter opposition imperilled the bombers and forced bombing altitudes up from 10,000 to 21,000 feet, decreasing bombing accuracy. At medium altitudes the best formation against a bridge target had been a

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single-ship attack, with bombs being released in repeated passes until the bridge was destroyed, but higher-altitude attacks, and enemy fighter opposition, required 4 ship flights and pattern bombing.[15] By September 1951 Bomber Command was employing an axis of attack as close to 90° to the bridge as was possible, the idea being that because there was a random pattern on salvo and minimum-train bombing, the bombardiers would gain accuracy with the increased ease of sighting permitted when they were able to use the long axis of the bridge as an aiming point for rate adjustment.[16] A major portion of Bomber Command bridge interdiction sorties used conventional demolition bombs, preferably 2,000-pound GP bombs fuzed .01 nose and tail and a few bombs fuzed with delays set variably to detonate from 1 to 144 hours after the drop, thus hindering repair of the bridge cuts.[17] These delayed-action bombs promised much in theory, but intelligence reports indicated that many North Koreans were either fanatical or fatalistic enough to dig them out and dispose of them. What Bomber Command and Fifth Air Force alike needed was a selective-impulse and delayed-action aerial mine which could be seeded into rail and highway checkpoints to extend the interdiction into periods of unfavorable weather or darkness.[18]

Razon-Tarzon Experiments: In process of losing accuracy because of higher bombing altitudes, the FEAF Bomber Command could have also utilized some type of ordnance which would add precision to its bridge attacks At first, guided bombs, including both the 1,000-pound razon and the 12,000-pound tarzon, appeared to hold great promise for the B–29 interdiction task in Korea. The razon had been developed for employment from B–17 bombers in the latter stages of World War II, while the larger tarzon missile was still in a developmental stage in the summer of 1950. Both were remotely controlled by a bombardier's radar signals; both were designed with attached flares to enable a bombardier to keep track of them in his bombsight.[19]

In July 1950, FEAF had requested that razon and tarzon bombs be given operational tests in Korea, and following USAF approval B–29's modified for launching these bombs were assigned to the 19th Bombardment Group Technicians from the Air Materiel and Air Proving Ground Commands were assigned to expedite preparation of the guided bombs for combat. The 19th Group dispatched its first razon combat mission on 24 August 1950, and within a little more than a month 100 of these bombs had been dropped, of which only 35 had been successfully controlled. A majority of releases showed the same malfunctions. bombardiers were either unable to follow the bomb's fall through the crab-mirror provided for the purpose or else the bomb reacted improperly to control in flight.[20] Many of the problems were due to the fact that the razon bombs, designed for delivery by B–17's, were being dropped by B–29's, but other malfunctions arose from damage to the razon control assemblies from long storage and poor packaging, lack of constant power and presence of spurious radar signals, lack of bombing tables, and a substantial difference between wiring diagrams contained in applicable technical orders with those actually found in the control assemblies. Correction of these difficulties brought more successful operations, and out of a grand total of 489 razon bombs dropped, 331 (67 per cent) were controllable. The last 150 razon missiles dropped had a control reliability of 96 per cent, and in all 15 bridges were destroyed by razon bombing. It was the final opinion of the razon project officer that, within the destructive capability of the 1,000-pound bomb, a bridge could be destroyed with a maximum of four razon missiles, provided the bombardiers were as well trained as those of the 19th Group had become.[21]

Razon bombing was suspended in December 1950 in favor of the newer and more destructive tarzon missile. Still in developmental stage, this bomb was an unknown quantity to the 19th Group technical section, but even though no member of the group had ever before seen the missile, they had three of the bombs ready for combat within 72 hours after

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arrival of the necessary equipment The first tarzon was released on 14 December 1950, the object being to strike from 20,000 feet a railway tunnel in a relatively quiet sector of Korea. This bomb missed the target, but after the technicians had completely reworked the tarzon control assembly and made several modifications, another bomb scored a direct hit on a small factory on 22 December. But of the 10 bombs dropped in December 1950, the group had only one direct hit and the other bombs ranged off target by up to 2,200 feet.[22] Eventually most technical defects were cleared up, and when five successive tarzon missions destroyed their targets in March 1951, the missile was thought to be reliable as a primary weapon On 29 March three tarzon bombers were dispatched, under cover of a conventional bombing raid,* to sever the Sinuiju rail and highway bridges. Only one of the bombers got through to the Yalu, and it lost control of its bomb apparently because of spurious radar signals.[23] On 30 April came the startling evidence that the tarzon bomb could not be salvoed safely; such had been suspected when a crew was lost in ditching on 29 March but now another crew had a jettisoned missile explode about 1.5 seconds after it entered the water off Okinawa.[24] Resultant investigation showed that the tarzon's tail assembly could break off on an impact, pulling out safety wires, and automatically arming the bomb.[25] FEAF immediately suspended all tarzon bombing until the Air Materiel Command could incorporate a positively safe salvo feature.[26]

During its short combat history the razon-tarzon program ran "intermittently hot and cold," and even before a positive salvo safety could be perfected, the FEAF Bomber Command recommended abandonment of the program. The missiles required specially-modified B–29's, thus tying up too much of the limited medium bomber strength Except for the international bridges at Sinuiju, no really suitable targets for tarzon were thought to remain in Korea. In tactical usage, moreover, tarzon had to be dropped from approximately 17,000 feet, too low to be safe from hostile flak; the flare was also extremely difficult to follow amidst flak bursts. Taking all these facts into consideration, a FEAF conference on 13 August 1951 recommended that the razon-tarzon program be abandoned, and on 29 October USAF took the necessary action to discontinue the effort in FEAF, action which involved the return of the specialized equipment and technical personnel to the Air Proving Ground Command, where tarzon research and training would be continued.[27]

Because of tactical considerations the tarzon and razon bombs had been permitted only a limited test in Korea Actually, the missiles had shown reasonable and improving reliability: of 28 tarzon bombs dropped in combat, 12 had been controllable for a 43 per cent reliability, and 6 of them had destroyed their target.[28] When good materiel was used, the accuracy of razon bombing from 14,000 feet was similar to the accuracy of B–26's visual bombing from 2,000 feet. The accuracy of tarzon was slightly superior to that of razon.[29] The razon project officer maintained at the termination of the project that he could "prove that one guided bomb is worth one thousand conventional bombs against 'line targets'—bridges, etc." [30]

Fighter-Bomber Experience: Although cognizant of the value of properly applied interdiction, the Fifth Air Force in early 1951 was limited by the nature of its aircraft, the peculiar elusiveness of Communist targets, and a growing hostile antiaircraft capability. The fighter-bombers lacked the weapons-capacity to destroy major Korean bridges, and as long as the ground was frozen, the enemy could expeditiously repair the damage or route traffic around bomb craters on his roads. During the first few months of 1951 the Fifth Air Force therefore emphasized armed-reconnaissance missions, commonly utilizing the bulk of its aircraft in such endeavor during intervals of respite from support of major ground engagements. In February the Fifth Air Force effected a major improvement in armed-reconnaissance procedures when it assigned each wing a specific zone of action, thus enabling fighter pilots to acquaint themselves

**See* Chap II, p 59.

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with specific routes and terrain and thereby more readily to identify Communist targets.[31] Little effort was made to destroy road bridges because the smaller streams were frozen and larger rivers could be forded in their low-water season. In mid-February, however, the 452d Bombardment Group (L) was relieved from attacking enemy supply dumps and used against railway bridges north and south of Wonsan and north of Pyongyang.[32]

The Fifth Air Force also experimented in search of methods for improving its interdiction techniques. One of the most frustrating of Communist tactics was their use of the very numerous road and rail tunnels of North Korea for the storage of military supplies and as daylight-havens for trucks and trains. The destruction of a tunnel could thus be expected to destroy hostile equipment and to interdict the transportation route which passed through it. At the personal direction of General Partridge, the 7th Fighter-Bomber Squadron in March 1951 flew a number of experimental sorties against several tunnels within friendly territory, using HVAR's, napalm, Tiny Tim rockets, 500-pound and 1,000-pound GP bombs. Efforts were made to skip-bomb ordnance into a tunnel's mouth and to penetrate the burden of earth or stone above On one tunnel a Tiny Tim rocket, penetrating downward through 23 feet of soft soil and clay, caused a 90 per cent block, but it was reasoned that such results would be impossible where, as was most frequently the case in North Korea, the tunnels were hewn through rock formations. In no case, moreover, did the available ordnance cause more debris within the tunnel than could be cleaned up within a relatively short time.* Better results were obtained in the testing of methods for the destruction of personnel or supplies sheltered within a tunnel. Skip-bombing attacks, using 500- or 1,000-pound bombs with sufficiently delayed fuzing to insure that they exploded far up in the tunnel could deal with sheltered objects.[33] That same month a research party inspected 14 tunnels, all of which had been subjected to aircraft attack during recent fighting. Neither napalm nor HVAR appeared to be an advisable weapon for such attacks, the latter being ruled out on the grounds of a 1:9 probability of hitting the tunnel's mouth. Machine-gun fire, directed into tunnel openings, had some possibility for causing destruction of supplies stored within, but delay-fuzed bombs still appeared to be the favorable ordnance for tunnel attacks. The investigators recommended, however, that no air attacks should be made for the explicit purpose of destroying tunnels with the weapons currently available.[34]

Similarly vexatious were Fifth Air Force efforts to discover an aerial means to destroy caches of Communist rice, customarily easy to locate but always dispersed in small quantities in the open. Test methods included contamination by JP–1 or fuel oil but the rice did not become inedible; burning it with incendiary ammunition or napalm was attempted but rice burned with difficulty; in the end it appeared that strafing attacks could scatter the grain but obviously the enemy, with his large supplies of manpower, could with Oriental patience reclaim the grain.[35]

The Fifth Air Force during April 1951 continued armed-reconnaissance missions, utilizing safer tactics of higher altitudes, increased power settings, and higher speeds as the enemy augmented his flak defenses along the main supply routes (MSR's).[36] At the end of May the retreat of a badly disorganized enemy and the beginning of seasonal rains permitted the Fifth Air Force to effect an earlier planned road interdiction program,* aimed at reducing the enemy resupply to his front-line troops from railheads 75 to 100 miles rearward The plan was to posthole MSR's with 500-pound bombs and to drop antipersonnel butterfly bombs around the craters in sufficient density to delay repairs.[37] This planning was followed for some 45 days in June and July without substantial results; the butterfly bombs lay on the surface where

*Tests in Italy in 1944 had earlier demonstrated that tunnels were "poor bombing objectives" (*See* AAF Evaluation Board, MTO, vol V The Relative Effectiveness of Various Type Bombs and Fuzes against Strategic and Tactical Objectives, 20 Oct 1944, pp 123–124)

*Confusingly enough this program was called STRANGLE, and FEAF later saw fit to apply the unfortunate code name only to this road interdiction operation *See* pp 161–62

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they could be easily identified by the enemy and exploded by such expedients as rifle-fire or dragging them with a long rope or timber Once these contact-bursting bombs were detonated, Communist labor forces speedily repaired, bridged, or detoured the bomb craters.[38]

Perceiving a lack of success with roadway interdiction, the Fifth Air Force turned its attention intensively to road and rail bridge destruction. In July 1951 the fighter-bombers also began experimental missions against railway trackage. The 8th Group got good results by glide-bombing attacks made against railway tracks with 500- and 1,000-pound bombs. The 49th Group tried skip-, dive-, and glide-bombing tactics and even attempted to burn small rail bridges with napalm Glide-bombing with 100-pound GP bombs, fuzed for a 5-second delay, apparently gave good results and accuracy against railway tracks. Additionally important, considering the fact that the Communists were now building up their antiaircraft defense around key bridges, was the 8th Group's casualty record against railway tracks during July: it did not lose a single plane on a rail-cutting mission once it had reached the section of railway prebriefed for attack. As yet the enemy had not covered their rail lines with antiaircraft fire.[39] On the basis of this suggestion Fifth Air Force planners began enthusiastically to plan a comprehensive rail interdiction operation within enemy-held North Korea

The Rashin Raid: As the Fifth Air Force was beginning intensive interdiction against North Korean railways, the Far East Air Forces was authorized to complete some unfinished business against Communist supply depots in Rashin, long proscribed as an aerial objective because of its proximity to the Siberian border. Located on the far northeastern coast of Korea about 17 miles from Soviet territory, Rashin (Najin) possessed a warm-water port and naval base, a part of which was reportedly under lease to the USSR; extensive marshalling yards with connecting railways to Vladivostok; and oil storage areas, which had been designated by the JCS as a significant strategic target in July 1950. The U.S. State Department had been extremely dubious about the wisdom of attacking Rashin from the outset of the Korean war, but President Truman had allowed the bombing of military targets in the city. Lest there be an undesirable border violation, USAF had cautioned FEAF on 4 August 1950 that attacks against Rashin had to be made only under visual flight conditions and positive identification. When the FEAF Bomber Command struck Rashin for the first time on 11 August, however, FEAF had neglected to specify a visual attack and the B–29's employed radar. Resultant bomb patterns were off in azimuth, the center of the impact falling in unpopulated areas with negligible damage either to the city or to the briefed targets. Although no violation to the Soviet border was alleged, USAF strongly directed FEAF's attention to its visual attack requirement On 22 August, 64 B–29's were again sent to Rashin, but bad weather forced their diversion to an alternate target. At this juncture the State Department strongly objected to the continuance of Rashin as an air target, and on 1 September 1950 the JCS had directed that Rashin would not be attacked either by air or naval means.[40]

The viewpoint of Secretary of State Dean Acheson was that Rashin lay entirely too close to the Russian border and promised the grave danger of involvement of that power in the Korean war. Apparently the JCS in August 1950 did not consider the target too important: it was obviously a collection point for Communist supplies but it possessed no direct rail connections to the southward Thus all supplies collected there had to be trucked southward to a railhead and there transshipped to the battle area. Destruction of the depots and rail yards at Rashin would mean that other depots would undoubtedly be provided the Communists within Siberia and the effort of shipping the supplies by vehicle an additional 17 miles would not be substantial. General Omar Bradley, JCS chairman, reasoned that all supplies moving southward out of Rashin could be effectively interdicted somewhere along the long coastal route.[41] In U.S. Senate hearings concerning

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the military situation in the Far East, held in Washington during the spring of 1951, General MacArthur testified that he had been "very anxious to destroy" the "great distributing center" at Rashin; General O'Donnell assured his questioners that the FEAF Bomber Command could have destroyed either the whole city or its rail yards without jeopardy to the border MacArthur's supporters cited the Rashin episode as "a flagrant example of political interference in military decisions" [42]

For almost a year Rashin remained off the FEAF target list, and by August 1951 aerial reconnaissance revealed that the Communists were extensively stockpiling materiel and supplies there. Oil storage facilities, rail repair shops, and extensive marshalling yards made Rashin a significant target, and there were some intelligence indications that the port was being used as a base for covert ocean shipping to the east coast of Korea. On 1 August 1951 General Ridgway therefore requested JCS permission to bomb the city, and when the JCS required more details, he indicated that the most valuable targets were the marshalling yards, including both rail facilities and a large aggregation of rolling stock. The JCS was willing to allow the attack against a legitimate supply target and on 10 August 1951, following presidential approval, it authorized an air attack against Rashin.[43]

Since northeastern Korea lay outside the range of Fifth Air Force fighters, FEAF requested escort from carrier-based aircraft of Task Force 77. Bomber Command established a mission of 30 B–29's, with the 98th Group to be first over the target followed in trail by the 307th and 19th Groups As the JCS cautioned, crews were carefully briefed not to violate the Soviet or Manchurian borders and to attack the marshalling yards only by visual means, with a radar assist as necessary on the initial point and course. Ordnance included a maximum loading of 500-pound GP bombs in the 98th Group and 100-pound GP's in the 19th and 307th; to retard rehabilitation, a good percentage of the ordnance was fuzed for a variable delay of 1 to 144 hours. On 25 August 1951 the mission was carried out much as it had been planned. Flying from the *Essex,* 23 F9F and F2H jet fighters joined the bomber formation at 1245 hours and until 1330 hours provided excellent cover but met no air opposition. During this period 35 B–29's (more bombers were dispatched than ordered and only 2 aborted) bombed visually from 16,000 to 19,200 feet in CAVU weather. Of more than 300 tons of bombs dropped, 97 per cent hit the bulls-eye All planes returned safely to their bases. "The whole mission came off perfectly," reported Col Harris E. Rogner, vice commander of FEAF Bomber Command, who led the mission. "We had good weather over the target, good formation, and an excellent bomb pattern. We clobbered them." [44] After this initial attack UN aircraft did not again return to Rashin.

COMPREHENSIVE RAILWAY INTERDICTION

The Fifth Air Force Plan: For an operation which would, in one form or another, occupy UN air for some ten months, Operation STRANGLE* had a somewhat nebulous beginning Although the Fifth Air Force fixed 18 August 1951 as the initial date of STRANGLE, some rail-cutting attack missions had been flown by fighter-bombers the previous month The originator of the unfortunate word STRANGLE, as applied to the first phase of railway interdiction, was unknown even to General Weyland.[45] It is apparent that the operation was originally conceived for short range employment. The Communists had indicated their desire for a negotiated peace, and there was reason to believe that they were in trouble and that a negotiated peace could be obtained in a short time. As the truce talks prolonged the ground stalemate, periodic evaluations, each of which

*See pp 161–62 for a discussion of the use of the code name STRANGLE

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found no more profitable air targets permitted by current restrictions in North Korea, embellished and continued the program in an expectation of achieving success through accrued results. What was begun as a short range operation thus became a long range air campaign.

The basic concept of STRANGLE involved a close appreciation of the enemy supply status and an adaptation of what FEAF had learned about interdiction in the first year of the Korean war. The limited amount of air effort which had been committed to interdiction had paid large dividends in retarding Communist ground movement. Not only did the Red armies lack much in the way of modern transport, but UN air attack had also forced them to disperse their supply dumps, adding greatly to their security and distribution problems.[46] Communist ground attacks had collapsed in from one to two weeks, due to the casualties inflicted by air-ground action and to a failure of their supplies to keep pace.[47] War materiel for the NKPA and for the CCF had been imported from beyond the Yalu from the outset of Korean hostilities. For personnel sustenance the Chinese had attempted initially to live off the land in Korea, but by March 1951 locally procurable supplies had been used up, and they were compelled to bring their food from Manchuria, approximately 200 miles from the battle line.[48] While the best Eighth Army intelligence fixed the daily supply requirement of a Chinese or North Korean division in combat at about 50 tons,[49] even this modest amount of supplies was difficult to deliver to front-line troops, and in May and June 1951 there were many reports that the Communist food situation at the front was serious.[50] With the beginning of the Kaesong talks stalemate at the ground front, the Communists gained a logistical advantage: not only were they expending fewer supplies but according to Eighth Army calculations they were stockpiling some 800 tons each day behind the front lines. Only UN air possessed the capability of checking this enemy supply buildup, and the stated purpose of STRANGLE thus became: "To interfere with and disrupt the enemy's lines of communication to such an extent that he will be unable to contain a determined offensive by friendly forces or be unable to mount a sustained offensive himself." [51]

Given the desired objective for STRANGLE, the Fifth Air Force carefully investigated the Communist supply system. Except for the output of a few small-arms factories, the enemy had to bring all war materiel from Manchuria, and for such transport he was completely dependent on his rail and highway systems. Carts, pack animals, and human carriers could handle a great amount of supplies in the forward areas, but these were insufficient for a long haul from the Yalu. According to the Eighth Army there were 60 enemy divisions south of the line from Sariwon due east to the Japan Sea, each estimated to require about 40 tons of supply a day when not engaged in combat, or a grand total of 2,400 tons. An enemy truck could be expected to haul 2 tons, making necessary a fleet of 1,200 trucks for handling the daily supply tonnage. Eighth Army estimated that a truck would require as much as 10 days for a round trip between Antung and the battle lines; to be on the conservative side, the Fifth Air Force estimated 5 days, with the result that some 6,000 trucks would have to be employed daily to haul the enemy's complete resupply from Manchuria. Such computations did not take into consideration the enemy's rail capacity: Korean railway cars could each handle approximately 20 tons, and no more than 120 boxcars brought daily to the railheads at Sariwon and Pyongyang would suffice a normal resupply effort. To run the railways, fuel supplies of coal and wood were obtainable in North Korea whereas motor fuel had to come from Shanghai or other refining points. From an air viewpoint, rail lines were attractive targets: they could not be hidden nor could rail traffic be diverted to secondary routes or detours as could motor vehicles [52]

On the basis of this analysis the Fifth Air Force decided that it would be most profitable for its aircraft to destroy the North Korean rail system, forcing the enemy to wear out his trucks. Again according to Eighth Army estimate, a truck, hauling cargo over Korean

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roads under the conditions which could be imposed by UN air, would last only about 60 days; the Fifth Air Force allowed a 100-day life. Wrecks would destroy a part of the trucks, and UN air action was thought to be taking a toll of about 150 enemy trucks destroyed each night. Denied the use of their rail lines and forced to depend entirely upon trucks, the Communists would have to replace as many as 5,000 to 7,500 vehicles a month—losses which would probably become prohibitive.

Fifth Air Force planners now cast about for the most effective air attack method for destroying the railroads, three methods being immediately apparent. 1) blow out all bridges, 2) destroy rolling stock, or 3) destroy rails and roadbeds. Destruction of bridges would cut rail lines into short segments, but the Communists had shown themselves willing to operate a train over as short a distance as 11 miles and then to unload and reload cargo on another train beyond a bombed-out bridge.* Furthermore, the enemy held a growing ability to defend his bridges with antiaircraft fire. To interdict a rail line solely by destroying rolling stock had never been demonstrated as particularly successful, nor did it appear so now. In July the fighter-bombers had shown that they could make rail cuts; the chief difficulty met with this form of interdiction had been the fact that the enemy shuttled heavy rail-repair equipment down from the north to repair these breaks. To eliminate this deficiency, STRANGLE planners thought it would be well to destroy a few key bridges and thus immobilize the heavy repair equipment.[53]

Because the Fifth Air Force did not have sufficient strength to complete the rail interdiction plan in a reasonable time, it shared the program with the Navy and the FEAF Bomber Command. NAVFE was requested to interdict track on the lateral rail line across Korea between Samdong-ni and the east coast (see figure 13) and from Kilchu on the east coast southward to Pyonggang On the east coast line the track between Wonsan and Pyonggang was already badly damaged Bomber Command was requested to keep the railway bridges destroyed at Pyongyang, Sonchon, Sunchon, Sinanju, and Huichon; that command accepted the first four bridges but initially declined Huichon on the ground that it was too far north and made too hazardous by MIG's. The Fifth Air Force did not intend to neglect enemy vehicular traffic: when fighters had expended their bomb loads against rail targets they would sweep southward over the MSR's to break up any motor marches noted by day. The night-attack light bomber force would search primarily for vehicular traffic and would attack such rail traffic as it happened to observe As soon as rail lines were reduced to such a state of unserviceability that they could be kept out of operation with minimum effort, the Fifth Air Force meant to attack the Communist vehicular complex with similar all-out vigor, destroying parts and minor repair facilities and key points on the MSR's in order to increase vehicular turnaround time from 5 to 10 days.[54]

When viewed from the advantage of hindsight, the planning for STRANGLE was unrealistic on several counts. Most unfortunate was the code name for the operation. "I do not know just what degree of 'strangle' this caption was supposed to denote," observed General Weyland "In retrospect," he added, "I do know that it was an unfortunate selection of words, for it gave some who did not understand the real objective of the interdiction program a vehicle for proclaiming its failure." [55] The Fifth Air Force estimate of UN air capabilities was optimistic:

> The Fifth Air Force and attached units in conjunction with the U S Naval air units and FEAF Bomber Command have the capability of destroying the enemy's rail system in North Korea, and of hindering his highway transportation system to such an extent that he will not be capable of opposing the U S Eighth Army effectively

An enthusiastic key staff officer of Fifth Air Force assured General Vandenberg that "we are optimistic enough . . . to believe that with this program we can force him [the

*A Marine pilot rescued near Wonsan had watched a train shuttling supplies over a three-mile segment of clear track

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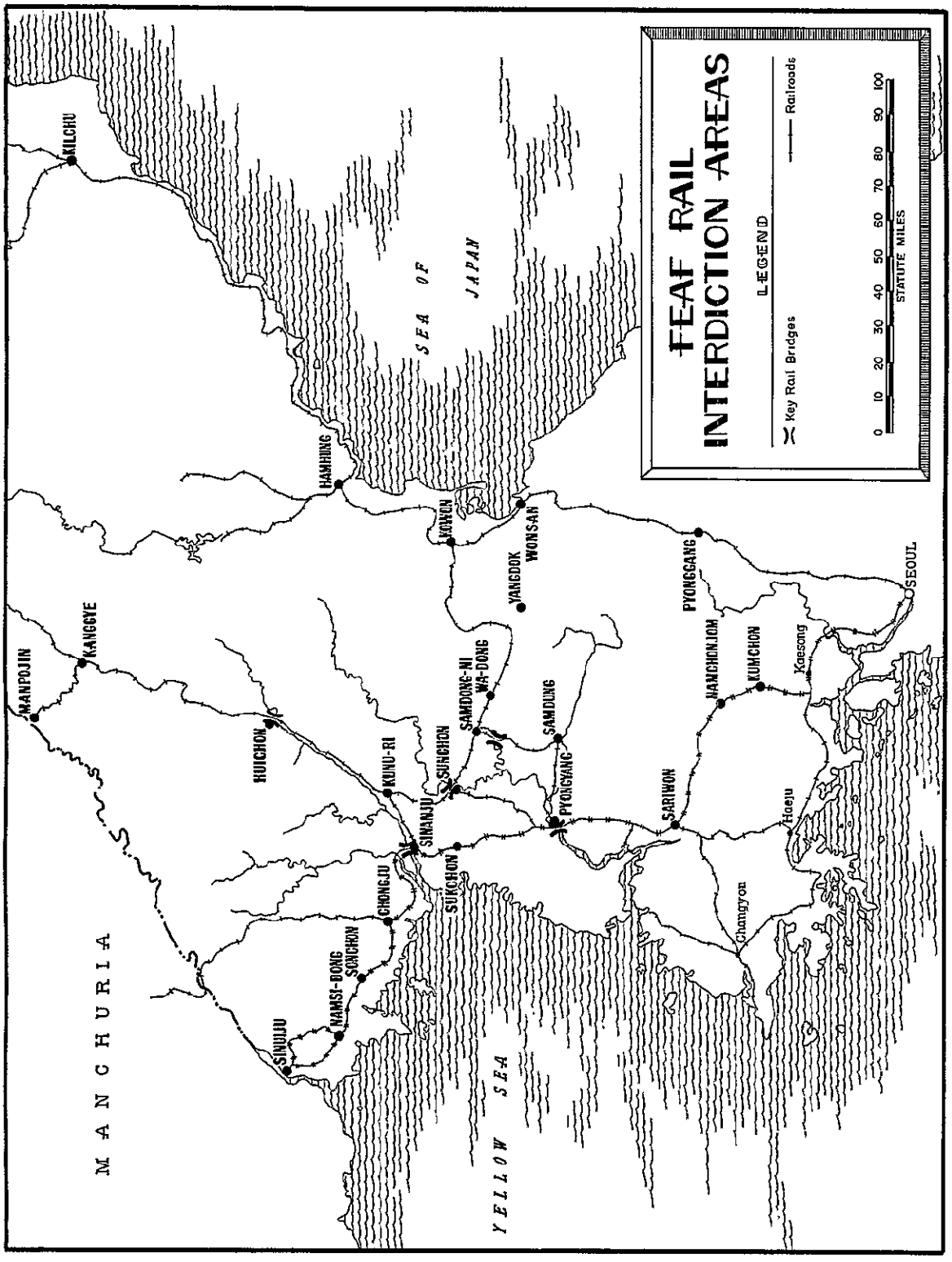


Figure 13

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enemy] to retire without any major battle to a line generally from Pyongyang through Kowon, which is a line generally 100 miles from and parallel to the Yalu River." [56] Such optimism was contrary to the experience of the IX Tactical Air Command in Europe during World War II· using fighter-bombers, each carrying two 500-pound bombs* and dive-bombing in deference to German flak, this command had found that it could expect to score no more than one rail cut for each eight or nine sorties flown. At this time ordinary line cuts on railway track were repaired in as little as five hours [57] Fifth Air Force planners, however, expected to employ glide-bombing attacks and to achieve a bonus effect from cumulative destructivity. Past experience actually provided no satisfactory guide for the STRANGLE planners because never before had such a massive and sustained air attack been hurled at a hostile rail system. Probably the most serious defect of the STRANGLE planning, an intelligence deficiency deserving additional treatment below,† was the failure of the planners correctly to estimate the enemy's capability to take effective countermeasures to their rail interdiction effort

The STRANGLE Operations: Initiated on 18 August 1951, the STRANGLE operations had good success for some three months, thus justifying the operations as a short term employment of the Fifth Air Force The sudden initiation of the attacks apparently took the Communists by surprise, and floods at the end of August assisted the UN air effort by washing out temporary bridges at Sinanju and Anju.[58] Those sections of the North Korean rail network upon which the Fifth Air Force employed its fighter-bombers were recognized as the greatest challenge of the air campaign. From Sariwon, just behind the battle zone, through Pyongyang, Sukchon, and Sinanju, to the Sinuiju entrance this main rail line was double-tracked, and by cannibalizing one track to keep the other open, or by criss-crossing from damaged to undamaged stretches of track, the Communists could be expected to keep one line open until cumulative attacks destroyed stretches of the entire road bed Within the month following the beginning of STRANGLE, however, the Fifth Air Force reduced the line from Sinuiju to Sinanju to 70 per cent single track, from Sinanju to Pyongyang to 90 per cent single track, and from Pyongyang to Sariwon to 40 per cent single track To keep his roads open, the enemy cannibalized 117 miles of track between Antung and Sariwon, and south of Sariwon he took up an additional 13 miles of track which had not been attacked, presumably to make repairs elsewhere. Marshalling yards and spur lines were also torn up for replacement rails.[59]

In the second month of STRANGLE the fighter-bombers destroyed track faster than the enemy could rebuild. Rail movement from Pyongyang to Sariwon ceased after 2 October, and when this line was apparently abandoned, the program shifted to selected sections of the line from Sinanju to Pyongyang, Kunu-ri to Sonchon, and from Kunu-ri to Huichon. After 25 October the rail line from Sinanju to Sukchon was unserviceable, but the enemy made herculean efforts to keep one rail line from Sinuiju to Pyongyang and another line open from Huichon through Kunu-ri and Sunchon to Yangdok. Between Kunu-ri and Sunchon the enemy repair effort stayed with the fighter-bombers cut by cut, but the line was blocked by three destroyed locomotives south of Kunu-ri for 10 days until weather allowed the Communists a slight respite from sustained air attacks.[60]

At the middle of November 1951 the Fifth Air Force had severed nearly all through rail routes to Manchuria. the enemy could still move south from Sinuiju to Sinanju, then east to Kunu-ri, then south to Sunchon (a slow movement because of limited serviceability of the Sunchon bridge) and from there to his central railheads at Yangdok and Samdung. He could also move from Kanggye down to Kunu-ri, then to Sunchon, and thence lateral-

*In 1944 the IX TAC had recommended "The ideal weapon for attacks on rail lines would be a fuze that would arm when the bomb struck the ground and then be sensitive (by vibration or from iron in the train) to a train when it approached" In 1951 such a device was still needed

†*See* below, p 155

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ly to central Korean railheads. On the east coast the enemy was shuttling traffic between bridges but he had no through traffic from Kilchu to Wonsan.[61] All that remained to be done in order to tie up both of the western rail routes was to destroy the short key link of road between Kunu-ri and Sunchon.

Simultaneous with the fighter-bomber attacks, FEAF Bomber Command had been attacking the bridges at Pyongyang, Sinanju, Sunchon, and Sonchon as a second priority to its continued neutralization of Korean airfields which the Reds were rebuilding in a frenzied effort, probably in order to bring MIG–15's forward to oppose STRANGLE.* When the priority effort permitted, Bomber Command also used its limited strength against marshalling yards, frequently jammed with rolling stock Fifth Air Force B–26's, guided for night attacks by shoran, and day-flying fighter-bombers also scored on the swollen marshalling facilities.[62] Sightings of night-moving vehicles along the MSR's paralleling the interdicted rail routes were greatly increased, indicating that trucks were attempting to compensate for the reduction in railway support.

Following their rail-cutting missions the fighter-bombers customarily split up for armed reconnaissance of prebriefed MSR's en route back to their bases. In deference to enemy ground fire, the 51st Group divided its 4-plane reconnaissance flights into elements, the first covering the ground and road from 3,000 feet and the second trailing at 6,000 feet to watch for flak and enemy aircraft.[63] Although the altitudes of search were thus somewhat higher than had formerly been employed in Korea, these armed reconnaissance flights were often fruitful: on 24 August suddenly clearing weather allowed a 16th Fighter-Interceptor Squadron flight to catch the Communists ferrying a large convoy across a river, and this flight, plus two others speedily dispatched, accounted for more than 40 trucks, 20 railway cars, several supply barges, and a large supply dump.[64] Other especially scheduled fighter-bombers got results with first- and last-light reconnaissance: two F–80 flights of the 80th Fighter-Bomber Squadron at last-light on 30 September destroyed an estimated 40 trucks and one tank out of a large convoy proceeding southward.[65] Early morning attacks found and destroyed locomotives which were tardy in getting under cover.[66]

Other than a general twice-daily time schedule established to coincide with Sabre patrols which drew off the MIG's, the Fifth Air Force initially allowed its wing commanders wide latitude in the accomplishment of interdiction strikes against assigned sections of railway.[67] Seeking to inflict maximum damage, most commanders employed "group gaggles" of 32 to 64 aircraft. Tactics varied by the group and according to the weather. Glide- and dive-bombing attacks were employed, with the former being the more effective, and necessary when there were low-flying clouds, and the latter offering the advantage of a lower loss and damage rate from enemy fire.[68] Although some planes carried 1,000-pound bombs in August, the standard ordnance loading against rail tracks became two 500-pound bombs, judged more suitable than heavier ordnance because of a lesser drag which increased airspeed and saved fuel.[69] Assessable bombing results for August-September revealed that the Fifth Air Force was substantially bettering the expectations of World War II: some 12.9 per cent of bombs dropped cut the tracks, or one-fourth of the total sorties flown obtained rail cuts.[70]

As STRANGLE progressed, however, the enemy concentrated automatic weapons along his rail lines, moving them to meet each change in Fifth Air Force objectives.[71] Initial Fifth Air Force tactics contributed to the enemy's successful countermeasures. Fighter routes to target areas, many of which were hit day after day, could be changed but little. some routes were straight-line and others dog-leg in course only, but the enemy could easily fathom bombing objectives and mount his automatic weapons accordingly.[72] In October the JOC had to allow the fighter-bomber groups to use up to 20 per cent of their effort against flak.[73] Group gaggles commonly em-

*See Chap. IV, pp. 129–30

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ployed the lead flights for flak suppression with VT-fuzed bombs, but the number of anti-aircraft weapons destroyed by such methods was small [74] and the enemy gunners had learned to take cover when the first planes came over and then come out to fire at later flights. Thereupon, flak-suppression flights had to be placed toward the rear of a group strike.[75] In October, group gaggles gave way to five-minute spaced squadron take-offs, permitting lead flights more time to search out and neutralize flak and preventing air-jams over the target [76] The time interval between squadrons was kept as short as practicable, and a succession of flights struck the target at a very close time interval so as to inflict maximum shock effect, effect surprise, and present minimum vulnerability to ground fire.[77] In addition to the hostile ground fire, the fighter-bombers were sporadically hazed by MIG attacks. Under such effective hostile countermeasures, Fifth Air Force efficiency declined. Dive-bombing became the rule for an attack, antiflak bomb loadings reduced rail-cut potential, and bombing accuracy fell off. Suggested remedies were increased pilot skills in bombing, to be achieved through an intensive training program plus group rivalry, and an increase in the bomb load carried by each fighter-bomber.[78] The latter expedient was attempted in October by F–80's which carried additional 100-pound GP bombs on their rocket rails, but their range and speed was so decreased by the added drag that the practice was ended late in the month.* [79]

From the outset of STRANGLE the enemy demonstrated great ability to repair rail cuts and he gained in efficiency at the same time that the Fifth Air Force potential was declining. Frozen ground no doubt assisted the enemy's temporary repairs, but by mid-November photographic reconnaissance flown 24 hours after an attack would very seldom find a rail cut unrepaired. In December intelligence sources indicated that the enemy, beginning work at dusk, could repair a rail cut within eight hours, thus opening the track for traffic from midnight to sunrise.[80] The Communists also displayed proficiency in bridge repair and in handling badly deteriorated stretches of track. They built bypass bridges at Pyongyang, Sinanju, Sunchon, and Sonchon which required continuing medium bomber effort to keep destroyed. Characteristic of their deceptive ability was the secret rehabilitation of a bypass bridge at the key junction of Sunchon; here two spans were always missing from the bridge in day photographs, but a night photo taken on 7 November showed that removable spans, handled by a railway crane, were inserted to make the bridge serviceable each night.[81] On 15 November reconstruction of the main highway bridge at Sinanju was completed, and by 30 November another bypass bridge at Pyongyang permitted through traffic eastward to Samdung for the first time since August 1950.[82] When it appeared that the Fifth Air Force would sever the critical Kunu-ri to Sunchon rail link, the Communists redoubled their efforts. In December they laid a bypass rail route around the badly mauled rail section south of Sukchon on the Pyongyang-Sinanju route and began a similar bypass on the Sunchon to Kunu-ri line. Sunchon bridges, although attacked and damaged, remained open, and the medium bombers were unable to keep the rail crossings at Sinanju unserviceable for more than two days at a time.[83] Work was also begun on the restoration of the badly damaged line south of Pyongyang to Sariwon [84] By 23 December the Fifth Air Force recognized that the enemy had "broken our railroad blockade of Pyongyang and . . won . . . the use of all key rail arteries." [85]

Assessment of the effectiveness of the STRANGLE operations in terms of the stated objective of the program revealed a fair measure of success. As pointed out by General Ferguson at a planning conference in December, STRANGLE had been "sort of a prophylactic measure." The enemy had made no large scale attack such as had been greatly feared at the end of August 1951, but it was impossible to determine whether he had never intended to attack or whether rail interdiction had dissuaded him.[86] In January 1952 both

**See* Chap VII, p. 217

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FEAF and Fifth Air Force wanted to attack more decisive target systems, such as North Korean hydroelectric power facilities. General Ridgway, however, advised the JCS on 4 January 1952 that the air interdiction program had: 1) slowed and seriously affected the enemy's supply operations, increasing the time required to move supplies to the front lines; 2) forced the enemy to divert thousands of troops and much materiel in the effort to maintain and protect his lines of communications; 3) destroyed thousands of vehicles and pieces of railway stock and a significant quantity of supplies, imposing an increased demand on the productive facilities of China and Russia. General Ridgway recognized that the air interdiction program had not prevented an adequate supply to front-line enemy units engaged in a static defense nor had it prevented enemy troop movements. As long as the Communists maintained a static front and limited their consumption, they could over a long period of time accumulate sufficient supplies for a major offensive. With the air resources available, General Ridgway stated, STRANGLE represented the maximum possible interdiction effort; if the operation were to be discontinued, or reduced, he pointed out that in a relatively short time the enemy would accumulate all the supplies needed for a major offensive.[87]

As early as January 1951 FEAF actively urged that the purpose of UN air operations should be to maintain effective and positive air pressure upon the Communist armies in order that the UNC might obtain the most favorable results at the armistice negotiations. So long as General Ridgway commanded, however, FEAF was not allowed to undertake the pressure operations. Railway interdiction was therefore continued in the hope that it might succeed through accrued results. As the rail interdiction attacks continued without change in tactics during January and February 1952, the fighter-bombers met greater difficulty. South of the Chongchon River the Reds had now spaced automatic weapons about every four miles along the rail lines;[88] thus in January Fifth Air Force had to take its F–84's off rail targets south of the Chongchon and to direct them against the rail link between the Chongchon and Sonchon. The F–80's were moved to targets on the railway leading northward to Huichon. That same month the earth was frozen so hard that bombs often skipped off the ground and exploded in the air, other bombs, striking the frozen surface, blasted upward and damaged low flying planes.[89]

Late in January 1952 the Fifth Air Force secured implementation of an experiment which combined the efforts of night flying B–29's and B–26's. Near Wadong, on the lateral Korean railway, a main highway crossed the railway in a narrow defile; it was believed that individual night B–29 and B–26 shoran raids could so saturate this "chokepoint" area of 480 x 1,650 feet with 500-pound bombs that all rail and vehicle movement would be blocked. Repair of roads and track would be difficult, if not impossible, because of the cumulative cratering in the target area. Traffic would then have to be diverted to the already crowded west coast MSR's where night intruder B–26's could increase their destruction. Using the highway underpass as an aiming point, medium and light bombers attacked the chokepoint between 26 January and 11 March 1952. In these 44 days, 77 B–29's and 125 B–26's dropped 3,928 x 500-pound bombs, theoretically one bomb for every 22 square yards, but bomb damage assessment showed that there were only 18 actual rail cuts and 15 road cuts and that the balance of the bombs merely churned up the surrounding countryside. The tremendous effort blocked the rail line for 7 days and the highway for 4 days, and, except for a slight interruption, the enemy was not compelled to alter either his rail or highway traffic patterns. From this "Wadong Chokepoint Operation" FEAF concluded that "it is a fallacy to assume there is an 'area target' for traffic interdiction. Actually the only target is the pinpoint destruction of road and rail lines proper, bridges, and rolling stock." [90]

Operation SATURATE: During the early months of 1952 the Fifth Air Force considered

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means by which its rail interdiction effort might be improved Although the rail lines were being cut daily at many points, the obstructions were not being maintained at night, in bad weather, or in frequent cases even while UN aircraft were not in the area during the day The enemy had revealed a persistent ability to repair small cuts in a few hours. Small repair crews, stationed at regular intervals along all major rail lines, could easily repair cuts made by one or two bombs, but Fifth Air Force intelligence had noted that when the fighter-bombers did sufficient damage to require the importation of heavy rail repair equipment rail restoration was slow. The scattered air attacks resulting from the policy of permitting wing commanders to select their own targets on given stretches of track had worked detriment to good flak intelligence, with the result that each wing formation had to divert a part of its ordnance to flak suppression [91] The coming spring thaw would also complicate the enemy's route maintenance and rehabilitation effort

So viewing these deficiencies of STRANGLE, a Fifth Air Force targets division study issued on 25 February 1952 asserted the requirement for 24-hour interdiction with a sufficient concentration of effort being expended to mutilate and, if possible, to destroy selected stretches of the road beds of the key rail lines. The fighter-bombers would concentrate their attacks against particular segments of track, hitting the same segment during most of the daylight hours with no more than eight hours' lapse between strikes. At night a roving B–26 flare ship would work with individual B–26's which would periodically expend a bomb load of 10 x 500-pound bombs at the rail cuts and then get about their work of reconnoitering MSR's, using their guns and externally-hung 100-pound bombs against road traffic. Four main lines were recommended for such intensive interdiction· Kunu-ri to Huichon, Sunchon to Samdong-ni, Sinanju to Mamsi-dong, and Pyongyang to Sariwon to Namchonjom. Because it believed that the B–29's had been given more bridges than they could keep neutralized, the targets division study recommended that they concentrate against the rail bridge complexes at Sinanju and Sunchon [92]

These SATURATE attacks were laid on during March 1952 On 3 March the fighter-bombers began the concentrated attacks against selected segments of rail line, the plan being to expend an average of 300 sorties and 600 bombs on each segment daily. On 15 March the B–26's of the 3d Bomb Wing began to supplement the day attacks by unloading their internal bombs over the rail cuts at periodic intervals during the night. Weather seriously handicapped the new plan, and the attacks were inconclusive until 25 March.[93] On this day the target was a segment of railway track between YD 0886 and YD 1087, these coordinates comprehending a rail section between Chongju and Sinanju especially selected because of an apparently high water table, a long road-bed fill, two bridges across small streams, and a minimum amount of flak On 25 March 307 fighter-bombers dropped 530 x 1,000-pound bombs and 84 x 500-pound bombs; on the second day 161 fighters expended 322 x 1,000-pound bombs. During the night of 25/26 March, 8 B–26's covered the rail gap with 42 x 500-pound bombs, but weather prevented attacks on the following night. Flak in the area was meager and inaccurate, with only one F–51 receiving minor damage on 25 March. Photographic reconnaissance showed that the enemy attempted no repairs on 25 and 26 March, but even while the attack was under way, he began to bring in the necessary repair materials. By 30 March, only five days after the initial attack, the Communists had the road bed almost completely rebuilt and tracks were replaced the following day. Assessment of the results of this 48-hour air attack noted that the railroad had been interdicted from 25 to 30 March and possibly for another day, but at least a part of this success was due to a thawing period which had soaked bomb craters and necessitated the hauling of dry fill and ballast. This attack, moreover, had committed the whole fighter-bomber effort, and while one key line was interdicted, the others remained

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open.[94] During the last week in March the B–29's were also successful against bridge targets. 41 of them knocked out approximately 225 feet of the bridges at Pyongyang on the 25th, 47 of them tore out 320 feet of the Sinanju bridges on the 28th, and the Sinhung-dong bridge was knocked out by 13 medium bombers on the last day of the month.[95]

Having been shown to be practicable, the SATURATE concept was continued, albeit with attacks of less magnitude than the initial effort but still concentrated against approximately two-mile-long sections of track on the main enemy rail lines. Day and night attacks were concentrated against the same sector for one or two days and then moved to another sector before the enemy could concentrate his flak.[96] The JOC now controlled operations closely, directing routes of approach, initial points, withdrawal procedures, and altitudes to each target in an effort to compress the time interval of attack and to shift targets when weather or flak dictated.[97] Once again, the fighter wings employed group gaggles, but the closer control of mission assignment permitted more intensive study of flak installations and destruction of these flak targets prior to a rail attack.[98] It was now possible for photo reconnaissance aircraft to reconnoiter the selected target between fighter-bomber attacks, and by photo interpretation of wet negatives the 67th Tactical Reconnaissance Wing was able to flash the results and flak position locations to the JOC in time to assist missions later in the day.[99] The spring thaw also assisted the bombing effort by complicating the enemy's repairs and deteriorating sections of cratered track.

Under STRANGLE there had been little standardization of strike tactics (as late as the spring of 1952 the fighter squadrons were commenting upon the lack of any accepted optimum method of rail attack), but SATURATE brought more satisfactory returns of bombs on the target.[100] Possibly disturbed by December photo-interpretation reports which showed that the F–84's were placing only about 7 per cent of their bombs on rail tracks,[101] the 49th Group commander required his pilots to glide-bomb, releasing their ordnance at approximately 1,000 feet above the ground. Such a requirement held danger since nearly all battle damage was occurring below 3,000 feet, but the group commander nevertheless maintained that if the target was important enough to merit bombing, it was important enough to hit.[102] Initially the 3d Wing B–26's accomplished their rail strikes before proceeding on route reconnaissance, but soon it became more practical to utilize especially dispatched aircraft for each task In making the rail attacks the B–26's employed a glide approach with a single release at a minimum of 2,000 feet. In moonlight the intruders required no artificial illumination, but flare aircraft assisted on darker nights, generally dropping their flares with a setting to open close to the ground so that the B–26's could bomb above the source of light, thus avoiding blinding and illumination of their position to enemy flak.[103]

But SATURATE was not able simultaneously to interdict the main North Korean rail routes. Evaluation of the new tactics indicated that available UN air effort was sufficient to maintain at best an average of six continuous intensive cuts on the enemy's rail lines. Since there were approximately 600 miles of rail line in the FEAF sector north and east of Pyongyang, it could be seen that several times this number of continuous cuts, properly spaced, would be required to deny the enemy the use of his rail system.[104] During April the effort successfully kept the rail line from Sinanju to Sinuiju out of operation continuously by means of an attack against XD 759936 to XD 776941 and a re-attack just as the enemy was completing his repairs Cuts on other major and vital lines in North Korea, however, were repaired rapidly and the lines did not remain unserviceable for any length of time.[105] By the end of April it was no longer possible for the Fifth Air Force to out-guess the enemy and attack undefended sections of railway, because all key lines were soon defended to such an extent that it was impossible to attack flak-free targets.[106] During the first half of May the SATURATE at-

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tacks were continued and provided a partial rail blockade to through rail traffic: the Sinuiju-Sinanju line was maintained unserviceable for 10 days, the Kunu-ri to Huichon line for 7 days, the Sunchon-Samdong-ni line for 9 days, and the Sinanju to Pyongyang line through the 15 day period.[107] In the final analysis, the SATURATE operations failed because the Fifth Air Force lacked sufficient aircraft strength to maintain over a 24-hour period the intensive rail cuts which would interdict the North Korean rail system

Communist Countermeasures to Air Interdiction: It is not enough to conclude that STRANGLE and SATURATE operations failed in their purpose of providing comprehensive railway interdiction in North Korea because of a technical insufficiency of aircraft; it is also necessary to inquire into a more pervading conceptual failure on the part of operational planning to assess correctly the enemy's capability for effecting successful countermeasures to the air attacks against his railways. A fundamental requirement for executing any successful military campaign is knowledge of the enemy; it is necessary to know his capabilities, probable course of action, and reactions under given circumstances. At the end of Korean hostilities, FEAF Intelligence had occasion to comment upon the scarcity of studies undertaken during operational planning regarding potential enemy reactions to UN aerial attack. Inasmuch as there had been but infrequent demands for such intelligence estimates relative to expected enemy reactions very few were accomplished, the majority of reaction estimates consisting of speculation among personnel at the working level. In the case of STRANGLE, Fifth Air Force planning had little concern with potential enemy countermeasures. Although the operation was initially attractive because of its virtually flak-free targets, no thought was apparently taken that the enemy might be able to reinforce his antiaircraft fire. The planners, as FEAF later noted, could have benefited from an estimate of the enemy's capability to repair bridges by improvisation or use of prefabricated spans, to establish networks of bypass bridges, to build new bypass railway lines, to amass coolie labor to maintain his logistical position, and when his supply was hurting, to increase his ground action along the main line of resistance in order to divert UN aircraft to close support and away from interdiction missions.[108]

From modest beginnings in June 1950 the Reds increased their antiaircraft artillery in Korea steadily, reaching an estimated 275 heavy and 600 automatic weapons on 1 July 1951 and 409 heavy and 1,318 automatic weapons on 30 June 1952. Viewed in terms of World War II, the Communist antiaircraft artillery establishment was small: even in June 1952 the Communist flak order in North Korea was probably less than the World War II defenses of many single cities in Germany. FEAF loss to enemy flak nevertheless was the major category of loss to enemy action (68 per cent), and concentrations of automatic weapons along the MSR's made UN interdiction more difficult, lessened the effectiveness of rail bombing, and caused increased battle damages.[109]

The Communist flak arsenal ultimately included Soviet-made 12.7-mm. machine guns, 20-, 27-, 40-, and 45-mm. light automatic weapons; 76.2-mm. medium guns; and 85-mm. heavy guns. Most of these weapons permitted use for either antiaircraft or antipersonnel purposes, and during the spring campaigns of 1951 the general movements of these weapons coincided with those of the other ground force arms. Heavier guns, however, were usually in fixed defenses: Pyongyang in January 1951 was defended by 53 heavy guns and 63 automatic weapons.[110] By April and May 1951 the enemy was also defending his North Korean airfields with heavy guns, while some heavy flak batteries had moved up immediately behind the front lines.[111] Consonant with the need for combatting predominantly low-level air operations, the Communists concentrated automatic weapons along the main rail lines after August 1951. Their tendency was to employ such weapons in ground positions, diverting them to alternate positions as dictated by operational require-

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ments, rather than to use any appreciable amount of train- or vehicle-mounted AAA.[112] By June 1952 the enemy was using over half of his flak (132 heavy guns and 708 automatic weapons) to protect his bridges and supply routes.[113]

In the railway interdiction attacks the fighter-bombers had less to fear from the heavier guns than from automatic weapons, small arms, and infantry weapons fire. Communist troops trained for the Korean fighting had been taught the Russian doctrine that: "Disruption of rear supplies is the foundation of victory and vigilant preparations against enemy air attacks are especially important tasks." Air defense thus became the duty of each unit, which was charged to maintain air observation sentries and to employ available fire against aircraft flying at less than 4,500 feet, especially in those vulnerable moments when the plane was diving, releasing, or climbing.[114] Captured enemy documents indicated that in January 1951 the Chinese forces also organized especially trained "Hunter Groups," organically assigned to regiments and divisions for protection against aircraft. Equipped with heavy caliber machine guns, these hunter groups reportedly drew good pay and uniforms, and for the confirmed destruction of three UN aircraft in any 90-day period the "hero" was given a 15-day leave. A variation of the special incentive award was reported by an escaped Fifth Air Force pilot as "a month's vacation in Pyongyang or Peiping, all the fine foods he can eat during his vacation, and plenty of good looking women."[115]

The concentration of hostile ground fire along the North Korean railroads reduced the effectiveness of air interdiction by forcing the fighter-bombers to attack from higher altitudes and to employ dive-bombing tactics The concentration also took an increasing toll of UN aircraft: 26 lost and 24 damaged in August 1951, 32 lost and 233 damaged in September 1951, 33 lost and 238 damaged in October 1951, and 24 lost and 255 damaged in November 1951.[116] Automatic weapons and infantry fire found the F–51 particularly vulnerable and contributed to the excessive losses of this conventional fighter, losses which totaled 96 in fiscal year 1951 and 66 in fiscal year 1952.[117] Such a loss and damage rate was a severe strain on Fifth Air Force strength: by April 1952 FEAF had received only 131 replacement aircraft of the types engaged in rail interdiction against the 243 it had lost and the 290 major damaged aircraft on interdiction sorties [118] The Communist air defense thus contributed to the maintenance of their acceptable logistical position.

The Chinese and North Korean ability to keep their supply lines operative in the face of constant air attacks revealed a tenacity and determination which had been equalled by few armies. Using organized recovery programs, Red engineers consistently met the physical destruction inflicted upon their supply routes. Road repairs were the province of the North Korean department of military highway administration, comprising 12 administrative regiments, each mustering 3 or more 550-man battalions. Each battalion was assigned a sector of a MSR, and platoons of the road-repair companies were stationed about three kilometers apart along important routes. Road patrols on foot reported impassable spots to the nearest road-repair company, which worked at night with hand tools to eliminate the obstruction. The North Korean railroad bureau was responsible for the recovery and maintenance of rail lines; with headquarters in the outskirts of Pyongyang, this bureau controlled some three brigades, each of 7,700 men. Units of 50 railroad-repair troops were stationed at major rail stations, while crews of 10 men were located about every 4 miles along the routes. Rail walkers spotted cuts during the day and recruited nearby citizens for the necessary manual labor; after nightfall experienced military repair crews undertook the supervision of the manual tasks and made the actual repair of ties and rails.

The Communist repair effort attempted to anticipate UN air attacks, locating repair materials at convenient spots along the routes and storing supplies of prefabricated items such as bridging spans. Spare materials were kept near all main bridges and at railway centers. In many cases one or more by-

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pass structures were built while an original bridge was still intact. Only on the larger bridge projects was labor-saving machinery available, and the emergency repairs made use of much unskilled hand labor. One POW railway repairman listed his unit's equipment as iron bars, picks and shovels, wrenches, gauges, hammers, and a hand-operated clamp used to straighten slightly bent rails. Repairs on railways were crude but effective. when a wide and deep bomb crater obstructed a track, it was either refilled or shored up with a framework of crossties and the rails were relaid, when one side of the track was destroyed, straw bags filled with dirt were placed along the embankment to prevent erosion and the center of the crater was filled with dirt [119] Local labor was impressed with such tools as the citizen possessed; as well as being available in quantity the impressed labor had the advantage of providing its own logistical support. Because of the abundant unskilled labor and crudity of repairs, the section gangs were able to repair several adjacent rail cuts in virtually the same elapsed time as for a single obstruction. According to FEAF observations the Communists repaired rail cuts in from 2 to 6 hours, bypassed bridges in from 2 to 4 days, and repaired concentrated "maximum" effort damage to rail lines in from 4 to 7 days.[120] That the recovery efforts were profligate in their requirements for manpower was evident: counting persons engaged on route repair and in antiaircraft activities, the Fifth Air Force estimated that as many as 500,000 citizens and soldiers were mobilized to resist its railway interdiction program [121]

The military supply system used by the Communists in North Korea was based upon the "delivery forward" principles perfected by Soviet armies in World War II. This logistical system was a two-fold effort in which rear area logistical commands moved supplies to forward depots and supply points, where the supplies were picked up by rear service sections of front-line units. Movement of supplies within logistical commands was done where possible by train with auxiliary truck support; below the depot level, movement was generally by truck; from unit dumps to front-line troops ox-carts, pack animals, and human carriers moved supplies. Supply depots and points generally remained stationary, being too well dug-in and dispersed to be easily moved even when the progress of battle was favorable.[122] Apparently the major impetus of Communist supply from Manchuria passed through Sinuiju and Manpojin, whence the cargoes were routed to the major supply areas at Sopo, Pyongyang, and Yangdok, and thence again southward, chiefly by vehicle, to the six subordinate branch depots located near Mulgae-ri, Suan, Koksan, Singosan, Sepo-ri, and Hoeyang. From these points supplies moved to army and corps dumps All dumps south of the 39th parallel employed extensive camouflage, dispersion, revetting, and often were defended by antiaircraft artillery.[123]

Defecting Korean railway employees from Pyongyang and Yangdok presented a picture of the limited but persistent rail movements into those supply depots. In the spring of 1952, according to an ex-railway clerk from Yangdok, 7 or 8 trains, each consisting of 10 to 15 cars, traveled the lateral Pyongyang-Wonsan line nightly. Seventy per cent of the cargo brought to Yangdok by train was food, 20 per cent gasoline, and 10 per cent equipment and ammunition. Tunnels served as repair centers and as concealment for trains during daylight hours, as many as 10 locomotives and 50 freight cars being hidden in the tunnels east of Yangdok daily, always with fuel- or ammunition-laden cars placed in the middle reaches. Trains moved by day only when weather prevented UN air operations.[124] Rail cars arriving at Pyongyang carried 90 per cent food, including rice and kaoliang, they returned northward empty or sometimes carried scrap metals. Equipment and ammunition, being explosive and too critical to permit delays, according to the Pyongyang source, were transported by truck. During February 1952 approximately 9,000 tons of freight (300 carloads) came into the west Pyongyang railway station.[125]

When the rail lines were pressingly interdicted by air attack, the Communists utilized truck transport to provide their supplies from

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Manchuria; trucks were normally required to handle resupply south of the major transshipment points. Thus either for short-haul or long-distance movement the estimated 2,448 tons of supply which the Communist forces on the front-line required had to be moved by vehicle during some stage of the journey. Each Red logistical command in Korea apparently possessed 4 motor transport regiments, each with 120 GAZ–51 trucks; main depots included 2 motor transport companies, each with 65 trucks; branch depots had 1 truck company; and Chinese armies also possessed trucks within their transportation sections, although animals might be issued when vehicles were not available.[126] Truck crews, comprising a driver, guard, and helper, generally traveled in convoys of 15 to 20 vehicles at night, using headlights only when meeting other vehicles, traveling mountain roads, or approaching dangerous spots in the road The degree of blackout, however, depended upon the anticipated danger of air attack and the urgency of the mission. Convoys frequently traveled with lights, relying on the sentries who were stationed at frequent intervals along the MSR's for warning of approaching aircraft. When alerted for air attack, the convoys reduced speed, blacked out, and continued along at about five miles an hour. Most trucks ran between 1800 and 0400 hours, and all vehicles were dispersed and camouflaged before dawn.[127]

Limited to night movements on rough and often tortuous roads, Communist truck travel was slow, although captured documents indicated that each truck was expected to cover 62.5 miles each day, or 1,562.5 miles each month, 5 days being allocated each month for necessary maintenance. A good estimate had it that enemy vehicles could average about 60 to 80 miles each night above the 39th parallel, and had to slow their pace to 50 to 70 miles per night below the parallel. A round trip from the Manchurian border to the battle front of eastern Korea (310 miles one way) could require as many as 10 nights' travel.[128] Captured documents showed that the Communists waged a constant campaign to sustain the morale of their truck crews: allaying their natural fears of air attacks, awarding the honor of "Transportation Hero" to the meritorious, and punishing "rightists who are fearful of death." One propaganda effort emphasized that "the loss of one trip due to illness of the driver means that 2,250 men cannot get food for one day." [129]

However laborious and crude the Communist supply system might appear by Western standards, it was able to provide the Red armies with daily resupply despite intensive attacks by UN air power. Benefiting from the inactivity in the ground fighting at the front, the Communist supply system was also able to stockpile reserve stores in advanced depots Thus on 21 May 1952 General Ridgway stated: "I think that the hostile forces now opposing the Eighth Army . . . have a substantially greater offensive potential than at any time in the past." As a natural consequence of a much reduced scale of fighting, the Communists had expended less ammunition and, despite air interdiction, had gradually built up far greater reserves of artillery and mortar ammunition than they had ever possessed in the combat zone.[130]

A NEW APPLICATION OF AIR EFFORT IN KOREA

Rail Interdiction in Retrospect: The comprehensive railway attacks against North Korea were to continue until the end of June 1952. In STRANGLE and SATURATE operations between 18 August 1951 and 30 June 1952, FEAF aircraft flew 87,552 interdiction sorties and during this period pilots claimed that they made over 19,000 rail cuts and destroyed 34,211 vehicles, 276 locomotives, and 3,820 rail cars. The cost to USAF was 451 aircrew casualties and 330 aircraft lost.[131] This effort had not been wasted: the operations had delayed the enemy's stockpiling, destruction of materiel had undoubtedly hurt him, and UN air had retained a whip hand over North Korea. The badly battered rail

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system would additionally deteriorate with the summer rains of 1952; it would not be capable of providing the sustained logistical support which the Communists would require if they ever again attempted to drive UN forces from Korea.

But by mid-April 1952, after eight months of sustained air effort against the North Korean railway system, it was evident that some new application of FEAF effort would be more productive. Despite utmost air efforts the Communists had maintained their current logistical expenditures, and by the accumulation of as much as 500 tons a day more than they expended they had built up their front-line stockpiles They could sustain another major offensive for as long as two weeks or an all-out defensive of three weeks' duration.[132] If they mounted such an offensive, however, they would once again have to expose their troops and supply lines to a devastating UN air attack and ground defense. Viewed in this light, the accumulation of Communist supply dumps at the front lines was not an unacceptable hazard to the security of the UN Command.

The sustained UN air attack against the North Korean railway system had not succeeded in placing upon the Communists the intolerable pressure which had been hoped for by interdiction planners Many miles of rail track had been literally destroyed and the enemy had been forced to pull up track elsewhere to replace it; yet, while important to the enemy, rail track was not particularly expensive or critical. Rail-beds had been severely damaged by air attack but the destruction of these beds was beyond the capability of UN air, the Communists had proven extremely apt in their repair. The Communists had also erected along their rail lines respectable anti-aircraft defense which was taking FEAF casualties faster than USAF replacement rates. Given the fact that the enemy had stockpiled supplies sufficient for an offensive, to continue the rail attacks would be to pit skilled pilots, equipped with modern, expensive aircraft, against unskilled laborers armed with picks and shovels. That the Communists were not being subjected to intolerable pressure by the rail attacks was best indicated by their willingness to continue obstructionist maneuvers at the armistice negotiations.

The Concept of PRESSURE Attacks: In a paper submitted to the FEAF Deputy for Operations on 12 April 1952, Col. R. L. Randolph and Lt. Col. B. I. Mayo offered a penetrating summary of the indecisiveness of the rail interdiction program and offered answers to the question: "Can we exert more pressure on the enemy by a different application of effort?" [133] Their concept was that FEAF could best contribute to a termination of the Korean stalemate by accepting as a goal: "To inflict maximum pressure on the enemy by causing him permanent loss" FEAF should seek to destroy such supplies, equipment, facilities, and personnel as would represent a permanent loss and accumulative drain to the enemy's strength. Under the destruction concept FEAF should identify targets according to: 1) effect of their destruction upon the enemy; 2) vulnerability to available air weapons; and 3) cost of the air effort to friendly forces. Colonels Randolph and Mayo recognized that "gold targets" were now rare in Korea; they thought of the problem as choosing targets which were least unremunerative. They accepted the overriding doctrinal priority attached to counter-air targets, including aircraft on the ground and in the air and enemy airfields in Korea, and noted that Communist hydroelectric facilities in North Korea comprised highly lucrative targets which were currently forbidden to air attack by JCS and CINCFE directives. Targets appearing potentially attractive to air attack were locomotives, vehicles, supplies, buildings, rear area troops and manpower, rolling stock, fixed equipment such as radar and guns, rails and rail-beds, and front-line troops, ranking roughly in the order listed by the consideration of effect on enemy, vulnerability to air, and cost to friendly forces Finding lucrative targets in North Korea would not be an easy task, but it was not believed to be an insurmountable one once the available reconnaissance and intelligence effort was given to the problem.

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These officers believed that once the concept—destruction—was clearly stated and made known to operations and intelligence agencies, targets could be found, developed, and successfully attacked, thus permitting a maximum of pressure to be brought to bear on the Communist forces.

While this study assumed that FEAF would continue to support UN ground troops in Korea, it offered a plan of independent air action against the Communist forces in North Korea. Its objective was to make the war in Korea so costly to the Communist regime that it would agree to a reasonable armistice. Unlike STRANGLE and SATURATE, pressure operations were not keyed to ground forces operations. In view of the lagging cease-fire negotiations in Korea, the study was well-timed to secure acceptance On 28 April 1952 the UN delegation presented a package-proposal to the Communists offering to withdraw objections to Communist reconstruction and rehabilitation of North Korean airfields, accepting Poland and Czechoslovakia as members of the neutral nations supervisory commission, if the Communists would agree to the principle of no forced repatriation of prisoners of war. This package-proposal represented the ultimate in UN concessions; when the Communists refused to accept it there was no choice but to intensify air operations against their regime in North Korea in the manner best calculated to bring them to terms.

Late in April FEAF began a shift in air attack policy toward the direction recommended in the Randolph-Mayo staff study. Issuance of a formal policy statement required much study of target priorities and did not come until 12 July 1952. In the preface to this directive FEAF noted the following appreciation of the situation·

> The Communist forces have amassed considerable air power in the Far East which can be employed against United Nations forces at any time the enemy may choose.
>
> The major sources of the enemy supply is off limits to UN air attack and the enemy pipeline from sanctuary to front lines is relatively short In addition, the ground fighting has been relatively stable for many months and the enemy supply requirements are low. Therefore, obstruction of enemy supply movement in Korea cannot prevent the enemy from gradually building up his stockpile.
>
> The requirements of friendly ground force units for direct air support in a stabilized ground front situation are minimized.

FEAF announced that the first priority of air effort would be given to the maintenance of air superiority and that other combat air effort would accomplish "the maximum selected destruction in order that the Korean conflict is made as costly as possible to the enemy in terms of equipment, supply, facilities, and personnel " [134]

Initiation of PRESSURE Operations: Even before the decision to abandon rail interdiction as the primary air effort was made, the Fifth Air Force had achieved a few notable successes against enemy supply targets. On 11 March 1952 the 8th Group threw an all-out F–80 attack against a 20-square-mile depot area near Mulgae-ri, utilizing 51 F–80's to drop some 277 tons of bombs and napalm in 254 effective sorties. This major supply area, one of the six Communist branch depots south of Pyongyang, was made a sea of flames [135] Similar mass fighter-bomber attacks followed On 8 May, 465 fighter-bomber sorties were unleashed against another of these supply depots at Suan, and on 15 May a vehicle repair factory north of Pyongyang was attacked by 265 fighter-bomber sorties.[136] At the end of May pin-point air strikes were directed against enemy supply dumps close behind the front lines Beginning on 23 June, massed UN air attacks put the North Korean hydroelectric facilities out of action.* Where possible, UN air sought multiple results, such as immobilizing transportation and destruction of accumulated materiel: on 25 June 201 sorties destroyed accumulated supplies and made unserviceable an overpass at the Samdong-ni marshalling yard.[137] On 28 June a 49th Group attack against an enemy motor vehicle park north of the battle line destroyed at least 150 trucks.[138] Interdiction was not completely

*These hydroelectric attacks marked the formal initiation of PRESSURE operations, they and similar operations which followed will be discussed in AHS–127, USAF Operations in the Korean Conflict, 1 July 1952–27 July 1953

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forgotten but rather integrated into a more comprehensive air strategy: with Korean streams rising from spring rains, fighter-bombers got good results from bridge attacks. Thus a major effort against the rail line between Kanggye and Kunu-ri on 7 June destroyed 12 bridges, tying up traffic on that line for 7 days.[139] These strikes marked the initiation of the new air strategy of PRESSURE which would be followed with excellent results during the last year of Korean hostilities.

A SUMMARY STATEMENT ON KOREAN RAIL INTERDICTION

The intensive UN air operations against North Korean rail lines between mid-August 1951 and mid-May 1952 have been viewed by critics of air power as "proving the fallacy of aerial interdiction." For the most part such an erroneous conclusion derives from the unfortunate use of the name "STRANGLE," a few extravagant statements by some air officers that air power was going to drive the Reds back to Pyongyang, and a not unnatural desire on the part of operating personnel, once the program was begun, to force an end to all North Korean communications and traffic.

The code name "STRANGLE" in Fifth Air Force was first applied to the interdiction effort which sought for some 45 days in June and July 1951 to destroy the Communist highway transport between North Korean railheads and the battle line, the name being suggested in an effort to avoid over-use of the term "Interdiction" to describe an aerial campaign. Once the term "Strangle" was brought into use it was loosely and erroneously used in Fifth Air Force headquarters for a time during 1951 as synonymous with the doctrinal term "Interdiction," and the term was readily passed on to describe the rail interdiction campaign which began on 18 August 1951: thus a series of operations analysis memoranda assessed the validity of pilots' claims in "Operation STRANGLE," utilizing June and July data relative to road bombing and August and September data concerning attacks against North Korean railways.[140] At a Fifth Air Force briefing for General Vandenberg the railway interdiction program was called "STRANGLE," and considerable weight to an official use of the term was provided in a press conference held in Washington, D.C., on 21 November 1951 by General Vandenberg and other high ranking Air Force personnel. Fifth Air Force information services releases also continued to refer to the rail interdiction program as Operation STRANGLE and one special release of 18 February 1952 was entitled "Six Months of Operation Strangle." In the spring of 1952 General Everest made efforts to eliminate the use of the term "Strangle," explaining to a press conference on 12 April that "Operation STRANGLE" had been the code name for a short-time highway interdiction program and that the term "Rail Interdiction Program" was the proper designation for the aerial interdiction campaign which had begun on 18 August.[141] The fact remains, however, that the unfortunate term "Strangle" had been extensively used as the name for the rail interdiction program, and to expunge it from the historical record would delete a significant object lesson that extravagant operational code names can bring popular discredit upon air power. Viewed in respect to the name "STRANGLE" the rail interdiction effort did not measure up to success, nor was the enemy rail system rendered completely inoperational as operating personnel would have liked, but the purpose of the operation was indicated neither by its code name nor the desire for absolute effectiveness.

The success or failure of the Korean rail interdiction must be determined from the stated purpose of the effort: "To interfere with and disrupt the enemy's lines of communication to such an extent that he will be unable to contain a determined offensive by friendly forces or be unable to mount a *sustained* offensive himself." Or, as General Ferguson expressed it, "one wants to be sure that the enemy has not got the means to launch a

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major offensive." Both Generals Vandenberg and Weyland saw STRANGLE as a unique form of limited interdiction, limited in view of the short distance to the Manchurian sanctuary and the fact that the enemy was not being forced to use up his supplies in active ground combat. Viewed in terms of its stated purpose the rail interdiction did not fail. The enemy did bring his front-line logistical support up from the bankruptcy level of June 1951 to a sufficiency for what the Eighth Army estimated was necessary to sustain some 14 days' frontal offensive action in August 1952. With the ground front static, the Communists built up their supply levels by virtual osmosis, the accretion of small amounts in excess of daily consumption. Such seeping resupply could not be interdicted. Consider, for example, the matter of Communist mortar ammunition: During December, January, and February 1952 the enemy fired 15,000 mortar shells per month, or 500 shells per day, at friendly forces along the front lines. These mortar shells weighed approximately 10 pounds each, and a North Korean could easily carry five of them on an A-frame. Consequently 100 coolies or one truck, arriving daily at the front lines, could supply a day's action of the Red mortars.[142] Granting that the enemy did eventually provide himself with enough supplies to sustain a limited duration offensive, it must nevertheless be noted that the rail interdiction program did such extensive damage to the North Korean railway network as to guarantee that the Communists would not possess the major logistical support necessary for a sustained offensive which would be capable of driving UN forces from all of Korea.

Although the rail interdiction operations undoubtedly achieved their stated objective, one may speculate as to whether some other air operations might not have sooner convinced the Communists of the futility of continuing the conflict. STRANGLE and SATURATE destroyed enemy rails, bridging, and transport, but neither was particularly destructive to the enemy's military potential and will to wage war. By the spring of 1952, moreover, the Communist peasants, who repaired the rail lines and rebuilt the bridges, were fairly successfully negating the work of UN air power. That Oriental mass manpower could overcome the obstacle of Western technology no doubt gave some proud moments to the Communist hierarchy in North Korea. Certainly the PRESSURE operations begun in June 1952 hurt the Communists where they had no means of mitigating the pain. Had PRESSURE been instituted at the beginning of the cease-fire negotiations it is quite probable that the Communists would have found less reason to delay the proceedings. But the Korean conflict was fought in the gold fish bowl of world opinion, and PRESSURE tactics were prohibited until the UNC had presented its "final" offer of armistice terms in April 1952.

Although the UN railway interdiction operations were limited by geographical area of application, force capability, and politico-military situation, they achieved their stated purpose; if they lacked the military effect which possibly could have been attained by other operations, they nevertheless conformed with a contemporary climate of world opinion which desired a cease-fire in Korea.

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Chapter VI

NIGHT INTRUDER AND SHORAN OPERATIONS

In the fall of 1950, Lt. Gen. James H. Doolittle, aviation pioneer and then coordinating USAF research, had observed that "an air force which can only fight during the hours of daylight and only under favorable weather conditions is at best half an air force."[1] In the second year of the Korean conflict the Far East Air Forces remained predominantly a day-fighting force, lacking the rounded all-weather capability needed to complete the air tasks presented to it But even by General Doolittle's definition, FEAF was considerably more than "half an air force." For night bombing in close support of UN ground forces in Korea it successfully utilized TADPOLE MSQ–1 and MPQ–2 techniques to control medium and light bombers.* As a by-product of other effort which became of independent importance, it provided nightly flare illumination of the Eighth Army battle line, greatly contributing to the morale and effectiveness of UN ground troops. Shoran provided FEAF with a method of aiming medium and light bomber attacks against fixed targets anywhere in North Korea and became, after October 1951, the principal method of attack permitted to the MIG-outclassed B–29 medium bombers. Night interceptors provided some degree of protection for UN installations in South Korea.†

While FEAF displayed an increasing ability to operate at night, its night capability was incomplete. with shoran and TADPOLE it could effect attacks against fixed or area targets, but it possessed no means other than the B–26 light bombers capable of extending the role of the fighter-bomber into darkness or adverse weather. Considered statistically the B–26's were unequal to the nocturnal tasks thrust upon them: during the period between July 1951 and June 1952, fighter-bombers flew 64,122 interdiction sorties while B–26 night intruders mounted 19,278 interdiction sorties.[2] In some measure this difference in effort was equated by the greater ordnance carrying ability of the light bombers, but the numerical disparity of the night intruder effort is stark when it is compared to potential enemy targets: in August 1951 the FEC estimated the Communists to be operating as many as 18,000 vehicles nightly in North Korea,[3] yet the Fifth Air Force in fiscal year 1952 possessed an average of only 103 B–26 night intruders, usually with an average of 74 of them combat-ready.[4]

Yet the problem of extending fighter-bomber type tasks into the night, or night intrusion, was far more perverse and difficult than to admit a solution by any such simple expedient as adding greater numbers of B–26 light bombers to Fifth Air Force strength. Had FEAF possessed a night capability greater than its average of 103 B–26's and 96 B–29's it could have been able to place more emphasis upon the 24-hour neutralization of fixed targets such as transportation choke-points, but it appears doubtful that the Fifth Air Force, lacking the necessary doctrine and systems for night intruder work, could have interdicted Communist night movement with any number of B–26's. Fundamentally, the Fifth Air Force was not effective in accomplishing its mission of interdiction in night and bad

*See Chap VII, pp 196–99
†See Chap IV, pp 132–33.

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weather, not because of limitations of the B–26 aircraft (although it had a good many), proficiency of crews, or a lack of sufficient numbers of aircraft, but because the offensive system which it sought to employ was not capable of doing the job. Although constant experimentation with tactics lent itself to a sounder appreciation of the problem, it became evident that there was no solution short of the development of the doctrine and equipment for an integrated night attack system at the USAF level.

THE NIGHT INTRUDER PROBLEM

Background Experience: "On the whole," wrote Col. R. J. Clizbe, who had commanded the 452d Bombardment Wing in Korea, "it appears that night interdiction in the USAF was born in an atmosphere of crisis, nourished during emergency, and virtually abandoned when the actual wartime need ceased to exist." [5] The AAF experience with night intruder operations during World War II had been limited. In the Mediterranean theater in June 1944, after the Germans had shown an ability to care for their logistical needs by night movement, the 47th Bombardment Group (L) was converted to night attack and its A–20's harassed enemy transport in the flat Po Valley of Italy. In Europe, as in Pacific theaters, night fighters were sometimes used as night strafers when air opposition permitted relaxation from their primary air-to-air mission. Much of the night air operation over Europe, however, had been the province of the British Royal Air Force.

There had been some AAF experimental work with night intruder tactics. In October 1944 the AAF Board had examined the feasibility of night attacks against targets of opportunity, utilizing flare-dropping aircraft and B–26 light bombers.[6] After its return to the United States the 47th Group had, between July 1946 and April 1948, conducted comprehensive tests designed at the direction of the Air University to develop doctrine and techniques appropriate to a tactical night striking unit employing light bombers. The night attack mission of the 47th Group was terminated shortly after these tests when it was equipped with B–45 jet bombers Thereafter the USAF possessed no night intruder unit.*

After virtual abandonment FEAF was forced to rebuild a night intruder effort shortly after the beginning of Korean hostilities, when the North Koreans eluded day-flying air power by the simple expedient of fighting and moving at night. General Stratemeyer soon stated an urgent requirement for the development of "equipment and tactics to seek out, see, and attack hostile ground equipment at night," [7] but pending the development of such new equipment he ordered the FEAF Bomber Command on 6 August 1950 to undertake nightly visual reconnaissance of Korean transportation routes and two days later he instructed General Partridge to step up night attack sorties, using B–26's, F–82's, F–51's, and F–80's. Neither the B–29's nor the fighter aircraft appeared suitable for night intrusion,† but the 3d Bombardment Group (L) began to handle the mission with more success. When USAF offered the 452d Bombardment Wing (L) to replace the lost day effort, General Stratemeyer approved the conversion of the 3d Group exclusively to night operations.[8]

The initial night operations by the 3d Bombardment Group successfully harassed the movement of the NKPA which apparently suffered an acute anxiety relative to air attack: General William F. Dean tells of being forced to dismount from the truck carrying him northward and to seek safety with his Korean captors 50 to 100 yards from the road each time a plane came over, no matter how black the night.[9] Late in August 1950 the

*For additional background *see* AHS–92, Development of Night Air Operations, 1941–1952

†Beginning in November 1952 the Fifth Air Force again employed jet fighters for night intrusion. That F–84's possessed a potential for such work is also tentatively concluded in Air Proving Ground Command, Interim Rpt, Project No APG/TAT/22–A–8, Fighter-Bomber Tactics and Technique for Night Tactical Air Attack, 18 May 1953

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Fifth Air Force instituted cooperative "buddy" missions with the FEAF Bomber Command, whereby B–29's dropped flares for B–26 attack Such missions were continued during the drive into North Korea, but despite conference and attempted coordination the 3d Group found the procedure too difficult because of errors in rendezvous, the great difference in altitudes flown by the two types of bombers, communicating problems, inaccurate flare drops, and flare failures.[10] On 2 October 1950 Bomber Command recommended suspension of B–29 armed reconnaissance as relatively ineffective, and because of trouble with AN/M–26 flares it suggested that all "buddy" missions be cancelled with the exception of such as could be supported by a small stock of British Mark III flares. General Stratemeyer approved these recommendations, with the exception that he wished the B–29's to continue seeding Korean MSR's with delayed-action bombs.[11] In the first phase of the Korean conflict it could be concluded that the B–26's had done much good merely by flying over the MSR's at night; there were also numerous occasions in the campaign when night intruders had attacked targets with telling effect; but a USAF evaluation group judged that "even these relatively good results accomplished little more than a harassing effect when compared to day operations against similar targets." [12]

Emphasis of Flare Operations, November 1950–July 1951: Despite the impracticability of the B–29 "buddy" missions, the 3d Bombardment Wing remained heavily dependent upon artificial illumination for its night intruder effort, both because of the inexperience of its crews and the mountainous terrain of the peninsula. As early as September 1950 the 3d Group attempted missions in which one B–26 was internally loaded with M–26 flares for cooperation with two bomb carrying B–26's, but while the technique proved practicable and more easily controlled than that of cooperation with a B–29 flare ship from another command, the World War II type M–26 flares were said to have generally averaged "from 50 to 60 per cent duds notwithstanding the fact that every conceivable action had been taken . to determine and alleviate the causes of malfunctions" [13] Commitment of B–26's to flare dropping, moreover, reduced the combat potential of the 3d Group.

Late in December 1950 the 3d Wing executive officer hit upon the idea of using C–47 aircraft for launching U.S Navy type paraflares, and immediate tests showed that such flares could be launched through a "stove pipe" type chute in a C–47 cargo door and ignited by a lanyard. Mark VIII flares used initially were soon replaced by more suitable Mark V and Mark VI types In a combat test on the night of 2 January 1951 a C–47 remained over Korean targets for 5.5 hours, launching 129 flares of which only 7 were defective.[14] This experiment having opened a new vista, 3d Air Base Group C–47's were extensively employed in highly successful flare drops in the vicinity of the battle lines during January 1951 Although it had been planned that the C–47's would cooperate with night attacking planes, the "Lightning Bugs" soon were shown to have a value to UN ground forces independent of air attack. Airdropped flares permitted friendly artillery to zero-in for night firing.[15] Maj. Gen. W B. Kean, commanding the 25th Infantry Division, reported that flare missions were of "inestimable value" and that prisoners taken were attesting that the "terrifying" illumination greatly circumscribed the enemy's ability to move at night.[16] G–3 Air of I Corps stated that a flare-dropping C–47 on the night of 20/21 February 1951 permitted artillery to catch groups of as many as 200 enemy soldiers trying to cross the frozen Han River.[17] Although many ground commanders initially distrusted the illumination of their positions (and coveted the time taken making reports asked of them in furthering the experiment) the Lightning Bugs were extremely popular with the ground soldiers, who dubbed the first C–47 so employed "The Old Lamplighter from the Korean Hills" Familiarity with the illuminated front and a growing experience with CCF methods of attack soon popularized the Lightning Bugs until supply was unequal to demand.[18]

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For air attack the "Lightning Bug" or "Firefly" had a geographically limited value to the area 20 to 30 miles beyond the ground battle line. Ordinarily one C–47 served nightly to illuminate a one or two corps front, operating 4 to 6 hours on a run. Other C–47 Fireflies cooperated with Marine F4U's and F7F's in close-in interdiction.[19] Initially, six C–47's were modified for flare drops, and in preparation for an all-out Communist offensive the Fifth Air Force modified six other C–47's for emergency employment. By September 1951, however, Marine night fighter pilots were protesting that there were not enough Firefly planes to support their activities,[20] and that same month General Everest requested assignment of an additional 20 C–46's in order to provide continuous night illumination of 7 target areas. At this point FEAF had to refuse the request, pointing out that it did not have sufficient stocks of flares to support such a number of planes.[21] Flare stocks, in fact, got so short during October and November 1951 that the Fireflies had to use Mark VIII and M–26 flares before a shipment of the more desirable Mark V flares reached Yokohama.[22] Some expansion of flare capability was permitted through Navy resources: as early as June 1951 tests showed that the PB4Y Privateer was suited for flare-dropping, having a good carrying capacity as well as armament features lacking in the C–47.[23] Beginning in early December 1951 a flight of two Privateers belonging to VP–28 of Fleet Air Wing 6 flew nightly flare missions for Marine F7F night fighters in vehicle hunts just north of the bomb line.[24]

Within Fifth Air Force the Firefly flight sought a proper administrative lodging. To manage the flare C–47's the Tactical Flight Section, 3d Air Base Group, was formally established on 6 February 1951.[25] Assignment of the function to the 3d Wing continued until early May 1951, when in order to provide wider coverage of the battle area the Tactical Flight Section was transferred to the 67th Air Base Group at Taegu. On 12 August it was reassigned to the 45th Tactical Reconnaissance Squadron, and finally in May 1952 it was again moved to the Special Air Missions Section of Fifth Air Force at Seoul Airport (K–16).[26] Despite a continuing inability to secure a proper administrative lodging and some low morale engendered among flying personnel by a 100-mission requirement before rotation (one pilot ran up 680 combat hours in his 100-mission tour),[27] the Firefly flight continued to render good but scarce services.

Although the 3d Bombardment Wing had devised the Firefly for its own purposes and in February 1951 used them to light road and rail targets for B–26's as far north as Sinuiju (each C–47 normally working with 2 B–26's), it soon realized that unarmed C–47's could not safely proceed north of approximately 39°30′ and therefore could not assist B–26 night intruders with deep-penetration missions.[28] The wing consequently began another project in February 1951 whereby adapters obtained from the Marines were fitted on B–26 rocket posts, enabling each intruder to carry either 100-pound bombs or Mark VI flares externally.[29] In July 1951 both the 3d and 452d Wings also modified several of their B–26's to carry a full internal bomb-bay load of 52 flares, the idea being that two attack B–26's would work normally with a single flare B–26.[30] This use of a B–26 exclusively for flare dropping was once more a great sacrifice in light bomber attack capability; moreover, the load of 52 flares was excessive to the needs of two accompanying B–26's.[31]

The preoccupation of the 3d Bombardment Wing with flares was indicative of its continuing efforts to work at low altitudes against road movements, a World War II tactical heritage which was not always practicable over mountainous Korea. Even in the relatively flat section of western Korea there were enough hills and small mountains as to make the region entirely unlike the Po River Valley or the plains of western Europe. Illumination was virtually necessary if the B–26's were to utilize their forward-firing armament; it was additionally of great assistance in locating trucks on moonlight nights when they ran without lights. Flare tactics, as employed in

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the spring of 1951, were most satisfactory when prosecuted by several aircraft. In searching for blacked-out vehicles an effective tactic was to drop an M–76 incendiary 500-pound bomb or a napalm tank in the middle of a road, thus blocking the route and providing a marker for the flare aircraft, which dropped its flares parallel but to one side of the road. These flares, igniting at 1,500 feet above the terrain, provided light for an attacking B–26.[32] When two B–26's worked together on the search and attack, the enemy had less inclination to expose his position by firing at the attacking aircraft, since he knew another B–26 was orbiting above and observing fire. It was also possible for a single B–26 to drop a flare and then descend for one or more figure-eight passes over the target, but such a procedure was little favored by pilots.[33]

The intruder wings also devoted much effort to improving their low-level attack capability. In July 1951 the 3d Wing installed twin 20-mm. guns in the noses of a few of its B–26's, which, coupled with 8 forward-firing .50-cal. machine guns, was said to be effective in convoy and vehicular destruction.[34] In low-level night attacks, rockets were generally not worth the effort required to carry them to the target: daytime accuracy with rockets was difficult and it was even harder to get hits with them at night. It was difficult at night to recover from the relatively steep approach needed to secure rocket accuracy and the flash of a rocket blast blinded the crew.[35]

Low-level attacks were nevertheless fraught with difficulty. Flare illumination worked best only at times of atmospheric suitability: if it was slightly hazy or foggy the flare tended to blind the crew and did more damage than good. There was also a problem in that if the flare was dropped too low it blinded the intruder crew, if it was dropped too high it illuminated the aircraft to enemy ground fire. A "pretty fair" solution was to string the flares parallel to and about a quarter-mile away from a road target.[36] Terrain problems greatly complicated low-level attacks, especially in mountainous eastern Korea. Charts were frequently inaccurate, necessitating a pull-out from attacking attitude at an altitude not less than 1,000 feet higher than the published height of terrain objects in the vicinity. As one pilot noted the "safe" pull-out altitude was additionally defined as 1,000 feet plus 500 feet for every married man on the crew. Under such conditions firing was generally started at 3,000 feet above the pull-out altitude and a dive angle held at about 30°, the result being that a pilot started firing some 10,000 feet from the target or even farther if the facetious definition is to be believed. As a general average, most pilots said that they generally fired at targets from 4,500 feet through 2,250 feet ranges.[37] At such ranges gunnery accuracy was difficult, working to the detriment of low-level intruder attack.

The Searchlight Experiment: Because of the imperfections of flare illumination, the 3d Bombardment Wing seized with some eagerness a dubious gadget which was offered during 1951. Visiting the Tactical Air Command at Langley AFB in February 1951, Col Virgil L. Zoller, commander of the wing, inspected an AN/ANQ–2AA searchlight which was locally reported as a very satisfactory "attack light" for use by B–26 intruders. Mounted under the plane's right wing, with elevation and azimuth controls in the cockpit, the searchlight had an 80-million-candlepower beam with an effective range of from 1,500 to 5,000 feet. While the pilot model could be operated only 30 seconds before it had to be turned off for cooling, a new modification was to allow 3 minutes' operation and then 3 minutes' cooling.[38] Colonel Zoller requested 72 of these lights for the 3d Wing, and General Partridge approved in the hope that they would be of some assistance to the intruder wings.[39]

This searchlight had been developed by the U.S. Navy which had had some success with it when used in blimp-patrols against enemy submarines during World War II. USAF officers recognized from the outset that submarine firepower was much more restricted than that normally expected from an impor-

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tant land target but thought the device worth a try.[40] Getting the light operationally mounted in Fifth Air Force B–26's once they began to arrive in July 1951 was a matter of exceptional difficulty,[41] but finally on the night of 12 September 1951 an 8th Bombardment Squadron plane showed that the light had some value: attacking a convoy of 40 enemy vehicles near Hwangju, the crew first dropped 500-pound incendiary bombs at each end of the convoy and then expended its ammunition and fragmentation bombs in 10 passes, destroying at least 16 trucks. On the first pass with the searchlight the navigator reported that "the truck drivers were literally scared out of their wits . . . and drove their vehicles into trees, off the road into ditches, and into each other." [42] Two nights later this same crew was shot down while attempting to illuminate a train for an attack by another B–26.[43]

Approximately 30 missions with searchlights during September 1951 indicated that the installation provided the pilot with a means of sighting vehicular targets, but it reduced speed and range, increased aircraft vulnerability, and was beset with maintenance difficulties.[44] In October both the 3d and 452d Wings had trouble with the mountings of the searchlights, which frequently snapped off and lost the lights in flight.[45] Finally, in November 1951, FEAF announced that it had no additional combat requirement for the AN/ANQ–2AA searchlight, explaining that the light afforded an excellent target and that its afterglow betrayed the plane carrying it, that combat testing had been marked with exorbitant loss and damages to equipment, indicating that it could not stand the stress of normal combat, and finally that the light had to be employed in relatively flat country where there were neither obstructions to vision nor concentrations of hostile ground fire.[46]

Efforts to Improvise Denial Devices: The Fifth Air Force customarily encouraged its wing commanders to propose at least one "wild idea" which might lend success to their efforts.[47] Thus in February 1951, 4 C–47's, covered by B–26's, dropped 8 tons of roofing nails along 4 selected MSR's in North Korea, the idea being that the tacks would puncture enemy truck tires and hold them in the vicinity until they could be destroyed by UN fighters at first light. The results were disappointing: only 28 enemy vehicles were destroyed by fighters on the morning following the tack attack The next month specially fabricated tetrahedrons, designed always to land with one sharp prong upward to puncture air-inflated tires, were dropped on North Korean highways, no evaluation was ever made of this weapon because of the advent of bad weather following the drop.[48]

First in June 1951 and thereafter as a standard denial device, the night intruders dropped M–83 butterfly bombs, clusters of small, antipersonnel bombs, designed to cover an area and to detonate when disturbed. While it was ordinarily hoped that these butterfly bombs would effect road blocks, 12 night intruder B–26's also used them against troop and supply areas northeast of Kaesong on 29 August 1951. It is possible that the bombs might have been often dropped from too high an altitude, but whatever the reason might have been, the M–83 was not believed to be an especially satisfactory denial device for use against road traffic: the effective radius of its component bombs was only 10 to 15 yards and the enemy cleared it quickly with rifle fire, lightly armored equipment, and personnel with crude clearance equipment. The intruders also made some use of GP bombs with M–123 and M–132 series delayed-action fuzes, but these were of limited value to the erection of a road block since a vehicle had to be within an area of effective blast at a purely arbitrary time of functioning.[49] It appears, however, that these denial weapons were infrequently employed, chiefly because there was no effective means to assess their results [50]

For use in blocking transportation chokepoints the Fifth Air Force would have liked to have had available a family of air-droppable land mines: a land mine which would destroy transportation itself, a mine or a mine-component which would prevent personnel from sterilizing the choke-point, and a mine which

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would effectively deal with heavier clearance-type equipment. Such a family of air-droppable land mines would have served to deny the enemy the use of certain road junctions and road routes, backing up road traffic for more effective night intruder attack [51]

Emphasis on Bombing, July 1951–March 1952: At some point in the summer of 1951 night intruder effort in the Fifth Air Force turned its emphasis from low-level strafing to a bombardment attack against enemy road traffic. The exact time of the change of emphasis is not apparent, but it is perhaps significant that FEAF, as early as May 1951, requested that its replacement light bombers should be glass-nosed B–26C's, more suited to bombardment attack than to strafing.[52] There is additional reason to believe that the change of emphasis originated with the 452d Wing, which converted to night intrusion in mid-June 1951 A variety of factors probably contributed to a gradually changing emphasis in the mode of night attack. For one thing, low-level night attack was complicated by the fact that the B–26 groups had mixed complements of B–26B and B–26C model aircraft, the former being "hard nose" strafers with a maximum of 14 forward-firing machine guns and the latter being "glass nose" planes with a bombardier's position and only 6 forward-firing guns.[53] The B–26C was thus handicapped in low-level attack because of its lack of fire-power, but either aircraft could bomb. a B–26B pilot could approach his target at a 25° to 35° angle of glide, pull up, and release his bombs when the target disappeared under the nose of the aircraft; the B–26C carried a bombardier and bombsight, capable either for synchronous or fixed-angle bombing.[54] Bombing did not require the use of flares, which were in short supply during the fall of 1951 [55] Pilot claims of damage in the 452d Wing during July and August 1951, moreover, indicated that 71 per cent of the vehicles destroyed were dispatched by aircraft performing armed reconnaissance with bombs, 23 per cent by aircraft performing armed reconnaissance with armor piercing incendiary ammunition, and 6 per cent by aircraft making secondary sweeps with API ammunition after having used their bomb loads on TADPOLE or shoran targets [56] In August 1951 the 3d Group is reported to have run "tests" of an unknown nature which demonstrated the effectiveness of horizontal synchronous bombing of enemy convoys from altitudes up to 8,000 feet, employing proximity-fuzed 500-pound GP bombs [57]

Establishment of the 3d Bombardment Wing at Kunsan (K–8) airfield permitted the Fifth Air Force to effect a more closely integrated night intrusion coverage in September 1951 As the 3d Wing requested, Fifth Air Force divided North Korea roughly in half along a north-south line, assigning the western half to the 3d Wing and the eastern half to the 452d Wing. The main enemy supply routes were given color designations, and the wings subdivided their allocated routes among their squadrons. By operating continuously over the same routes night after night, crews became familiar with terrain and trends of enemy activity which might be expected [58] Ordinarily, "lone wolf" intruders were dispatched at periodic intervals, usually 30 minutes, with 4-hour flights timed to cover assigned routes from dusk to dawn, during shorter summer nights the interval was cut to 15 minutes between flights [59] Since Fifth Air Force daily directed the routes for continuous night coverage, intruder crews could be given little targeting information, other than standing targets of last resort. Crews on earlier missions, however, radioed in observations of large convoys, supply areas, locomotives, and other targets of opportunity which might be profitable to later flights.[60] Such briefing was especially valuable on moonlight nights when vehicles were hard to locate; from early evening sightings intelligence officers could fairly well estimate where convoys might be found later.

When bombing tactics came into use the best results were obtained on the darkest nights, but on at least 20 nights a month lack of sufficient moonlight forced the enemy to use vehicular lights. Once a B–26 intruder

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had located a convoy's lights, the 3d Wing described the bombing tactic as follows: [61]

> Although the time that the headlights or blackout lights will remain on will vary, generally there will be sufficient time to allow a satisfactory synchronous bomb run When these runs are made from an altitude of 7,500 feet or above, and aircraft engines are set at a low RPM, the element of surprise is achieved and bomb runs up to four minutes in duration may be executed. In realizing this method of attack, a sufficient reconnaissance of the area from medium altitude should be made, and each target analyzed as to size, and direction of movement Existing curves in the road as shown by the light patterns may also be a factor. Once the analysis is complete, the aircraft may be directed to a given point which will allow both sufficient time for synchronization and the most effective attack heading In most cases, this attack heading will parallel the road, or intersect it at a slight angle. Once the aircraft is committed to the attack, synchronization may be accomplished either on the first available light along the road, or on the portion of the road which appears the most lucrative In either case, the final target for the bomb drop will be that portion of the road which had indicated the greatest concentration of vehicles Since course closely parallels the road, should the first light used for synchronization go out before rate can be established, rate may be set on the next available light Once complete synchronization is accomplished, the target for the drop may be selected and the crosshairs moved up to it. The number of bombs to be dropped can then be determined according to size of immediate target The keynote to effectiveness of this type of tactics is the complete analysis of the situation by the crew, and taking an entire convoy under bombing attack rather than a single light.

These new bombing tactics were getting underway at the same time that the initiation of STRANGLE rail interdiction forced the Communists to jam their road routes with truck convoys. In August one observer in a C–47 flare ship counted 150 lighted vehicles in a 15-minute period; a Texan, piloting a B–26, said, "the traffic reminded me of the crowd leaving the Cotton Bowl football game." [62] Utilizing the new technique the two intruder groups handed in remarkable claims of destruction· whereas in July they had claimed destruction of 750 and damage to 1,550 enemy vehicles, in August they claimed 1,935 vehicles destroyed and 3,633 damaged.[63] On the night of 24/25 August alone they claimed a total of nearly 800 vehicles destroyed or damaged, meriting the congratulations of General Weyland.[64] With all available B–26's working at night interdiction, General Weyland informed USAF that the night intruders had destroyed 2,362 and damaged 4,959 hostile vehicles between 25 August and 15 September 1951.[65] To hold these claims down somewhat, Fifth Air Force late in September issued a directive permitting night intruders to claim vehicles destroyed only when they were seen to burn or explode, but in October 1951 the Fifth Air Force nevertheless posted the claim of 6,761 enemy vehicles destroyed, the highest monthly total of the Korean conflict. In November and December the claims tapered off, but stood at 4,571 and 4,290, respectively.[66]

Although it was afterwards evident that these pilots' claims were grossly exaggerated, these reports of destruction received a certain amount of credence in Fifth Air Force, lending themselves well to extravagant assertions that STRANGLE would drive the Communists back to Pyongyang.* While it considered the validity of pilots' claims to be "an unknown quantity," an Operations Analysis study stated: "the principal result of interdiction in Korea . . . has not been the throttling of the flow of supplies to Communist troops, instead, it has been the attrition of at least 15 per cent of the total truck production of China and Russia by less than 100 B–26 aircraft." [67] By November 1951 both intruder wings were firmly convinced of the value of the bombing tactic: the 3d Group asserted that synchronous bombing was highly effective and capable of greater destruction than strafing, any efforts to "turn night into day" with flares should be reserved as a last-resort tactic. The 452d Wing concurred in this estimate: "Irrefutable evidence indicates that bombing is much more effective than strafing over a period of time and under all conditions. Strafing is superior under only the most ideal conditions." [68]

*See Chap. V, pp 145, 147.

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From hindsight, it is difficult to understand how the Korean night intruder wings could put such faith in night bombing attacks against moving targets at the same time that they were sorely pressed by a lack of trained bombardiers. During the Korean conflict the majority of observers assigned to the B–26 wings were former navigators, trained bombardiers being received in exceedingly small numbers Thus of 115 observers assigned to the 452d Wing in January 1952, only 13 of them were trained bombardiers Due to a lack of range facilities the Langley CCTS in the United States had been unable to provide bombardier training; therefore the Korean intruder wings were compelled to give the observers received such bombardment training as would allow them to serve a combat tour. To simplify such training as early as March 1951 the 452d Wing had requested assignment of British Mark IX bombsights, admittedly a less satisfactory sight for a trained bombardier than the Norden M–9 but easier to operate by observers who lacked bombing experience. A shipment of 45 of these Mark IX sights was received by the 452d Wing in November 1951; these sights were continued in use until May 1952, at which time the Fifth Air Force closed them out.[69] Still another solution was to employ the Norden M–9 sight with the reflex head for fixed-angle bombing; glide-bombing, in which the pilot served as bombardier, provided an alternate means of attack and the only method of employing the "hard nose" B–26B's in bombing attacks. In October 1951, before the arrival of the Mark IX sights, the 452d Wing's pilots estimated that they employed 29 per cent glide-bombing, 30 per cent Norden synchronous, 32 per cent Norden reflex, and 9 per cent other (combined or fixed-angle) types of bombing attacks.[70]

In their bombing attacks against enemy vehicular traffic, the intruder wings employed a wide variety of ordnance in combinations varying often with the modifications of individual B–26's. M–47 incendiary bombs were used in considerable quantity; occasionally it was claimed that the bomb made a kill by igniting the target but its primary purpose was to establish a reference point. M–64 500-pound GP's were extensively used, and in a wing analysis of 15 September 1951 the 452d pilots claimed best results against vehicles with this bomb. The M–81 260-pound frag bomb was widely used, a usual combination being 14 M–81's and 4 500-pound GP's. The M1A2 frag cluster was generally preferred to the M26A2 frag cluster, although both were available, because a B–26 could load four more of the former by doubling them on each top station.[71] Apparently there was little thought to the particular type ordnance which would logically be best suited to vehicular attacks; the usual analysis in the fall of 1951 sought to determine the optimum ordnance in terms of pilot claims. One such analysis, however, first cast doubt on the validity of the pilot reports· on 24 September 1951 the Fifth Air Force Operations Analysis Office noted that the intruder pilots appeared to find no one type of ordnance to be greatly different in effectiveness from any other, leading it to suspect that "pilots are claiming vehicles in proportion to the relative sortie capability expended." [72]

Although bombing tactics continued in emphasis, the intruder wings were in no wise solely committed to such attacks: the 3d Wing, in fact, preferred to maintain a 50–50 ratio of gun and glass nose B–26's, but by April 1952 attrition had so eaten into the B–26's that the wing had less than one full squadron of the planes At this time the Fifth Air Force directed transfer of 10 hard nosed B–26's from the 452d to the 3d Wing, giving the latter one full squadron of gun nosed aircraft and the former three squadrons of glass nose aircraft[73] The 3d Group reinstated flare cooperation attacks along the routes between Pyongyang and Sariwon in December 1951, when a shortage of night-fighter planes and crews forced Marine VMF(N)–513 Squadron to suspend its regular operations in the area.[74] Operating on moonlight nights, when the enemy moved his vehicles without lights along the relatively flat roads of western Korea, the 3d Group usually got closer to the deck. Working with flares or by moonlight, the intruders utilized smaller bombs, giving

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an increased number of possible releases. In March 1952 the 3d Group "moonlight session" found parademolition bombs with delayed fuzes worthwhile for minimum altitude attacks against trucks and buildings.[75] Probably due to the type of terrain in their respective operational areas, the 3d Group apparently always had more low-level attack enthusiasts than did the 452d.[76]

Low-level tactics were required for successful attacks against railway locomotives and box cars because trains were able to operate without lights. On dark nights it was practically impossible to locate railway traffic, but during the approximately 10 nights of moon illumination each month it could be found by intruders who flew not higher than 800 feet above the rail tracks. In the fall of 1951 both intruder wings turned in substantial claims for locomotives destroyed, the highest monthly claim being that of the 3d Wing for September and comprising 41 locomotives destroyed and 60 damaged.[77] While it was easier said than done, the 3d Group noted that "one very successful method of attack stops the locomotive first by cutting the rails ahead and behind the initial position of the train; mark the position of the train with a fire bomb and then applying low-level bombing attacks using 500-lb. parademos."[78] It was also possible to strafe and stop a locomotive on a first pass and then to destroy the train at more leisure.[79] Apparently 500-pound ordnance of some type was almost always employed by aircrews who sought rail traffic, due in no small part to the fact that the Fifth Air Force prescribed that a locomotive could be claimed as "killed" only when such ordnance was used.[80]

Declining Intruder Effectiveness, March–June 1952: In their operations of the last five months of 1951 the night intruders claimed a substantial harvest from the frantic Communist convoys brought out on the roads by the initial success of the STRANGLE operations against the enemy railways. But by the end of 1951 the Reds were making some progress in breaking the UN air blockade of their rail lines, and they had also built up their logistic stocks at the front lines With a static main line of resistance and fairly adequate logistics at hand, the Reds were no longer forced to extreme emergency trucking operations. Once front line stocks were built up acceptably, it did not matter to the enemy whether a truck, or a truck convoy, got to the front on a given day, or a week later, because the cargoes were not going to be immediately consumed.[81]

As the Communists built up their battle-line logistics and grew able to cope with railway interdiction, the number and density of vehicle sightings and attacks by night intruder wings declined markedly on the peak activity day of September 1951 (the 26th) intruders of the 3d Wing sighted 3,782 and attacked 2,588 hostile vehicles while on the peak day of January 1952 (the 31st) they sighted 2,107 and attacked 807 enemy vehicles. The totals for the peak day of February 1952 (the 28th) were even less: 1,692 vehicles sighted and 702 attacked.[82] With fewer and more scattered vehicles on the roads, the effectiveness of night intruder bombing tactics declined. Thus Fifth Air Force claims of vehicle destruction went off sharply from 4,290 in December 1951, to 2,489 in January, 2,367 in February, 1,750 in March, 1,723 in April, 2,694 in May, 2,016 in June, 452 in July, and reached a nadir of 235 in August 1952.[83]

While the downward trend in effective night intruder attacks against vehicles was already evident, the diversion of some 40 per cent of the 3d Wing's effort to assist fighter-bombers in operations SATURATE was purposed not to improve night intrusion but rather to effect an interdiction of North Korean railways which would be effective throughout the hours of darkness.* According to the planning paper for SATURATE, the B–26's, assisted in target location by a flare B–26, would proceed at regular interval to the rail-cut area, dump internal loads of demolition bombs upon the railway cuts made during the day by fighter-bombers, and then return home over their regular patrol routes, utilizing .50-cal. ammunition and such bombs as they carried on their rocket rails against hostile transpor-

*See Chap V, pp 152-53.

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tation targets [84] During March the 3d Wing accordingly scheduled approximately 49 B–26's nightly to attack rail interdiction cuts, using six 500-pound GP bombs with 0.1-second delay, nose and tail, to batter these sections of track The remaining external load was used in armed reconnaissance and varied with the route and moon phase: the 160-pound parafrag being used against vehicles during the dark phase and the 500-pound parademo in the light phase. Vehicular claims of the group were low during March because the time and ordnance required for the rail interdiction effort left insufficient time and ordnance for route reconnaissance. At the end of March the 3d Group therefore secured permission to schedule 12 aircraft per night exclusively against 3 rail cut targets and to devote its remaining aircraft to full and continuous route coverage [85] At the end of May the Fifth Air Force, acting on an operations analysis suggestion, directed that the B–26's would utilize antipersonnel bombs and delayed-action bombs of various sizes against the rail cuts instead of demolition ordnance, the idea being more effectively to harass the repair effort rather than to increase the rail destruction.[86]

The 452d Wing remained upon armed night route reconnaissance, but during March it got some highly successful results using bomberstream attacks against last resort targets in Hwangju, Chunghwa, and Sariwon. During April, May, and June the two wings devoted most of their effort to armed reconnaissance, generally employing approximately 30 sorties each There were some diversions to shoran targets, although the wings possessed a limited shoran capability. At the end of June a good proportion of the B–26 effort was utilized to provide MPQ–2 support for UN ground troops [87]

The period was one of declining night intruder effectiveness, in terms of claims of vehicles destroyed While a part of this decrease could be attributed to the diversion of B–26 effort to other targets, the trend in the vehicle kill rate per night armed reconnaissance sortie dwindled until Col G S. Brown, Fifth Air Force director of operations, observed "we were trading B–26's for trucks in a most uneconomical manner." The kill rate of vehicles per B–26 truck-hunting sortie had fallen from the October 1951 high of 3.15 to a low of 0 97.[88] On 7 June 1952 Lt Gen. Glenn O. Barcus, who had taken command of Fifth Air Force a week earlier, informed his staff that he was impressed by the lack of imagination displayed in the utilization of the B–26's. They were sent out, night after night, following the same schedule around the clock [89]

Evaluation and Redirection of Night Attack Effort: Spurred into action by General Barcus, the Fifth Air Force promptly undertook a thorough evaluation of its night intruder program. As this evaluation piled up data relative to the effectiveness of the program its greatest lesson was a reaffirmation that successful air operations are possible only with continuous and valid damage assessments "If you go along with what you think to be the perfect system and you do not assess the damages," pointed out an operational analyst at the USAF Night Intruder Conference in November 1952, "it is not going to remain perfect very long, because next day, or next month, or two months from then the enemy is . . going to find a weakness in the system and use it appropriately." [90] "The ability to assess," reported the 1st ARDC task group surveying intruder operations in Korea, "is practically as important as the ability to kill." [91]

Unfortunately the results of night intruder attacks in Korea had to be assessed primarily from pilot reports, kept as conservative as possible by Fifth Air Force definitions and often arbitrarily scaled down by the intruder wings Although both wings regularly sought bomb damage assessment photography, little or no such reconnaissance effort was made available to them.[92] Such efforts as were made to secure photographic coverage of route attacks, moreover, met little success: it was generally true that the attacking aircraft did not know his position to the degree of accuracy required to direct a photographic plane to it, and the photo reconnaissance air-

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craft frequently could not navigate to the spot with sufficient accuracy if it was definitely located. From 7 June 1952 to 4 July 1952 the 17th Bombardment Group (formerly the 452d) called for photographic coverage 163 times and received photographs from 49 strikes, less than 20 of which showed the target area, and only a few showed a target.[93] "We can go out night after night, and come home and not be too sure just what we have done," reported the FEAF director of requirements "We are not able to measure our effectiveness."[94] In the absence of bomb damage assessment, evaluations had to be made in terms of observations of enemy activity and tests made under controlled conditions.

During the fall of 1951 there was an accumulation of evidence that the night intruder crews, operating under conditions of limited visibility, were quite naturally unable realistically to describe the damage they did to the enemy.* The operations analysis study of September 1951 indicated strongly that pilots were claiming vehicles destroyed in proportion to the sorties expended. Vehicles claimed destroyed in the period September through December 1951 totaled more than the Communists were estimated to have had in operation in North Korea during August, and monthly claims of vehicles destroyed and damaged ran well above one-fifth of an estimated total Chinese and Russian monthly production of 33,000. While there was abundant evidence that the enemy was very conscious of the effectiveness of night air attacks,[95] vehicle sightings remained at a respectable figure.

Although there had been considerable skepticism concerning the validity of pilots' claims, Fifth Air Force had largely based night intruder bombing tactics against moving enemy vehicles upon these untested claims. In June 1952 General Barcus set his Operations Analysis Office to work upon a comprehensive test of night intruder bombing effectiveness. In the first part of this test the 3d and 17th Bombardment Wings were required to fly night bombing sorties on a controlled range, using their current bombing equipment and methods. The second part of the test involved the detonation of the various ordnance in use by the night intruders at specific distances from decrepit vehicles obtained for the purpose.[96]

In the bombing test crews selected from each level of combat experience in the 3d and 17th Wings dropped 710 bombs, employing synchronous, fixed-angle, reflex, and glide-bombing tactics. Of the 710 bombs, 25 per cent fell within the scorable capability of the range, which was 265 feet. Only 5 per cent of the bombs fell within 75 feet of the aiming point. As was to be expected, new crews had lowest proficiency, turning in an average circular error of approximately 500 feet; it was indicated that not until the 38th mission was a crew able to meet the Fifth Air Force requirement of a 250-foot CEP from 6,000 feet. This was not shoddy bombing, but it was not good enough for the size of a hostile moving target in North Korea.[97] Gunnery accuracy figures from the 3d and 17th Wings, for daytime practice missions where the sights could be adjusted after the first or second pass, showed only 1 to 2 per cent hits on a 10 by 10 foot target at ranges of 2,000 feet.[98]

The test of the effectiveness of ordnance commonly used against trucks demonstrated that vehicles not laden with explosive or inflammatory cargo were not particularly vulnerable to bomb damage except from impacts of less than 50 feet. Complete destruction of a vehicle required almost a direct hit, except when inflammable or explosive cargo was carried. When such inflammable or explosive cargo was carried, an impact within 75 feet was required to provide a reasonable assurance of destruction. The test found little differ-

*In the spring of 1953 a tragic example illustrated the wide discrepancy between actual and claimed damages On 30 March 1953 a B-26 of the 17th Group, through navigational error, made five separate attacks with four 500-pound GP and six M1A2 frag clusters upon a well-lighted ROK motor pool and adjacent road traffic Upon return to base, the crew claimed six enemy trucks destroyed, with one large fire left burning in the target area The ensuing investigation, however, showed that a total of four friendly Koreans had been killed and two jeep tires had been blown out by fragments No vehicles had been destroyed or incapacitated, other than the tire damages. This pilot was called one of the most conscientious in his squadron (Col. George H Kneen, Jr, The Night Intruder in Tactical Air Operations, AWC thesis, Apr 1954, pp 24-25, citing ltr 17th Bomb. Wg to CG FAF, sub: Investigation of Bombing Incident, 4 Apr. 1953)

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ence in the destructivity of bombs vs. trucks by the weight of ordnance: thus either a 20-pound frag or a 500-pound GP bomb would destroy a truck if it were a direct hit. Depending on the silhouette of the truck, the number of fragments hitting a vehicle from a single bomb impact at a given distance did not vary proportionally with the weight of a bomb; in fact, the limited data compiled in the evaluation demonstrated almost an equality of effectiveness in fragmentation damage between bombs. Evaluation of incendiary bombs M–47 and M–76 did not demonstrate that they were effective against vehicles, except, as in the case of any other bomb, when a direct hit or a near miss was achieved In view of these findings, the M–26 cluster of twenty 20-pound M–41 frags was the optimum weapon for attacking trucks.[99]

Comparison of the contemporary bombing skill with the bombing accuracy required to destroy or damage a vehicular target led to the conclusion. "The current night intruder program is not effective in destroying enemy vehicles because of inability to hit the targets." Considering all types of bombing, destruction of 1.8 trucks could be expected per 100 bombs dropped. Glide-bombing was somewhat more effective than Norden synchronous or reflex, having a probable destruction of 3 as compared with 1.3 vehicles per 100 bombs dropped. The operations analysts recommended two solutions, neither of which was thought to be especially practicable· 1) Emphasize intruder-flare teams using machine guns as primary weapons, 2) Devise some means for concentrating enemy vehicles so as to provide a more acceptable first-light fighter-bomber target.[100]

When these bombing test results were piled atop a climbing B–26 loss rate, General Barcus did not delay his action. In July route reconnaissance was relegated to second importance to JOC "special drops," or bomber-stream attacks against village targets lying along the North Korean MSR's. On 31 July the Fifth Air Force announced operations plan number 72–52, which formally outlined and directed the destruction of key supply targets in North Korea, initially by night bomber-stream and eventually by conversion to light bomber day attacks.[101] Believing that there were no targets in North Korea worth the loss of an aircrew and immediately motivated by the B–26 attrition rate, General Barcus set a minimum altitude of 4,000 feet for the light bombers, excepting only a very few experienced crews from the rule. For the majority of the light bombers, these rapid-fire decisions completed a cycle. in two years of the Korean war the B–26 had gone from day bombing to night bombing and back to day bombing because of the changing tactical situation and the inability of the airplane and system to cope with the problems of night intrusion in Korea.[102]

But the Fifth Air Force did not desire to lose its entire night intruder capability. Surveys in August 1952 showed that there were enough experienced crews to man one intruder squadron in each wing, and such squadrons—the 13th in the 3d Wing and the 37th in the 17th Wing—were designated.[103] New thought was given to the tactics to be used by these intruder squadrons. Study of the old system had focused attention upon an obvious defect in the B–26: under conditions of Korean topography it was an area bomber, poorly suited to low-level attacks against dispersed Communist vehicles. Operating alone, a B–26 intruder had little mathematical probability of killing vehicles by bombing. That the only real method of improving the B–26's destructive probabilities against vehicles was to devise a means of concentrating these moving targets into a suitable area target had occurred earlier to officers in the intruder trade, but the first definite road-block program, designed both to deny the enemy the temporary use of his MSR's, and to destroy the concentrated vehicles, was not instituted until late August 1952. Under this plan, fighter-bombers attacked certain selected highway intersections at last light, causing road-blocks and traffic congestion, and at first darkness two night intruder B–26's dropped butterfly and delayed action bombs on feeder or secondary roads Two major and two minor blocks were established each night on the highway net south

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of Pyongyang and on the lateral route to Wonsan. Forty-five minutes following the establishment of a major chokepoint, and at similar intervals throughout the night, individual B–26's flew armed reconnaissance over the isolated road, attacking motor vehicles from the minimum altitude of 4,000 feet with fragmentation bombs.[104]

A refinement of the road-block technique, known as the "Hunter-Killer" attack, was presented by Lt. Col Estes B. Sherrill, commander of the 3d Wing's 13th Squadron, at the Fifth Air Force wing commanders' conference on 20 September 1952 and was shortly afterwards implemented. Intelligence and operations personnel in the wings drew up three completely different sets of road-block areas encompassing all assigned reconnaissance routes and each numbered for convenient reference. Before a mission, "Hunter," "Killer," and flare crews were informed as to the particular set of road blocks to be made that night. The first "Hunter" aircraft thereupon reconnoitered assigned routes and blocked the road which appeared most profitable with fire bombs, general-purpose bombs, or butterfly clusters. After a block was made, the "Hunter" called in a flare aircraft to illuminate targets and a "Killer" aircraft to prosecute low-level attacks. The "Hunter" remained in the area, controlling the flare ship and each succeeding "Killer." The cycle was repeated as long as traffic proved lucrative.[105]

Neither the road-block nor the "Hunter-Killer" plan proved as lucrative as might have been the case had the Communists been pressed for supplies at the front, but each plan scored good results in terms of enemy vehicles destroyed: Fifth Air Force claimed 2,162 in September and 2,481 in October 1952. By early November 1952 the kill rate of vehicles was 3.94 per intruder sortie.[106]

Thoughts on a Night Intruder System: Out of the trial and error of the Korean night intruder experience was to come the concept of a comprehensive night intruder system. After a two months' survey in the Far East commencing on 28 May 1952, the 1st Air Research and Development Command Task Group concluded that night intruder operations had been ineffective, not because of aircraft limitations, but because of the limitations of the night intruder offensive system. Much the same thinking was reflected at the USAF-wide Night Intruder Conference held at Washington between 18 and 20 November 1952. Similar thoughts were incorporated in a series of theses done at the Air War College by students who had formerly commanded intruder wings or groups in Korea.

Such an integrated night intruder system had to be founded upon an agreeable definition of the purpose of night intrusion. "We believe that the proper role of the night intruder," stated a FEAF representative at the Night Intruder Conference, "is the maximum impedance or prevention of movement at night and in bad weather when the day fighter-bomber is on the ground." [107] In outlining its recommended system, the 1st ARDC task group accepted night and bad weather interdiction as the primary mission of night intruders, and their secondary mission would include attacks against fixed targets and in close support of ground forces. Interdiction of the battle area could be accomplished in five ways: by destroying supply concentrations in the rear areas, by destroying supply build-ups in the frontal areas, by cutting supply lines, by destroying the equipment used to transport the supplies and the supplies en route, or by denying the enemy the use of his lines of communication by the application of preventative weapons. No one of these methods was complete in itself, and each possessed certain impracticabilities. If, however, the last three methods of attack were combined into one system, to which would be added an assessment capability, the night intruder would be able to interdict effectively regardless of light or weather. Prerequisites for the offensive system included a capability to: 1) Detect small, mobile targets in bad weather and at night and place munitions close enough to the targets to obtain a high kill probability. 2) Locate important chokepoints under all weather conditions and deliver denial weapons accurately upon these points, even though

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they might not be detectable by airborne radar or infra-red equipment. 3) Be useable for all-weather close support attacks against enemy installations in close proximity to friendly ground troops 4) Be effective for attacks against large fixed targets such as supply concentrations, airfields, and marshalling yards. 5) Include weapons specifically designed for attacks against mobile targets. 6) Include weapons specifically designed to deny to the enemy the use of roads, railroads, and other transport routes 7) Include an ability to assess the results of attacks. 8) Be useable in all types of terrain [108]

Tried against such a conceptual standard, the capabilities of the Fifth Air Force night intruder system were markedly deficient. Until the summer of 1952, however, it appears that assessment of the needs of Korean night intruder units had generally been in terms of finding a suitable night intrusion aircraft and adding to it sufficient "black boxes" of specialized electronic equipment to do the job [109] Considering its vintage and the difficulties of supplying this obsolescent aircraft,* the B–26 in Korea operated surprisingly well but was "almost completely ineffective in accomplishing its primary mission as a night intruder." [110] Long out of production and obtainable only out of storage or from USAF commands which had put them to various purposes, the B–26's came to FEAF in so many configurations that hardly two of them were exactly alike. Changing tactics in Korea forced FEAF to change its configuration requirements repeatedly, complicating the modification lines in the continental air depots and adding greatly to the expense of preparing B–26's for combat [111] As a night intruder, the B–26's greatest single mechanical deficiency was its night lighting Although the ability to detect and attack targets depended upon human eyesight, the B–26's fluorescent cockpit lighting, combined with windshield glare, exhaust flame, and muzzle flash destroyed night adaptation of pilot vision. Progress was made in the installation of red-rim cockpit lights and in hiding the flash of machine guns, but exhaust flames could not be successfully dampened.[112] As an all-weather plane, the B–26 had a limiting defect in that it lacked proper de-icing equipment, and the lack of flight compartment heating made it a flying refrigerator.[113]

The uncertainty as to optimum night intruder tactics in Korea not only confused the work of modifying the B–26's but led to divergent thinking regarding a desirable night intruder. the 3d Wing, interested in low-level attack, specified an improbable type of aircraft designed to fly at 120 miles per hour but with a fast acceleration up to 400 miles per hour and a high rate of climb;[114] whereas a commanding officer of the 17th Bombardment Wing expressed the opinion that what he needed for the mountainous terrain of North Korea was "a stripped-down B–29 so he could carry a large number of bombs and stay over the target all night." [115] Much the same hiatus of thought was apparent at higher command levels: FEAF believed that it would be economically, logistically, and operationally desirable to devise an acceptable solution whereby fighter-bombers would serve the night intrusion role, with one squadron in each fighter-bomber wing being especially trained and equipped for the function, while the Fifth Air Force agreed that such a solution was to be desired, it nevertheless believed that there would be a continuing need "for an all-weather aircraft capable of detecting and attacking vehicular and rail traffic" [116] Officially designated as the replacement for the B–26 as a night intruder was the American version (B–57) of the British Canberra light jet bomber,* yet the 1st ARDC task group pointed out that this aircraft, while it had some improvement in performance and bomb carrying ability, was as completely lacking in the necessary detection and aiming equipments as was the B–26.[117]

The B–26 possessed little electronic equipment for locating and attacking area targets distant from the front lines, and none for the location and attack of moving targets of op-

*See Chap III, pp 84–86

*See Chap III, pp 84–86

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portunity.† The AN/APQ–13 radar proved valuable as a navigation facility but was virtually worthless for blind bombing of characteristically small inland targets where there was no land-water contrast; since the radar installation occupied the front portion of the bomb bay and required a skilled operator its over-all value for night interdiction in the B–26 was questionable.[118] In the fall of 1951 the B–26's had been well on the way toward establishment of a shoran capability but they had surrendered their equipment to the B–29's when the latter had been forced to turn to night bombardment. Early in 1952 the Fifth Air Force made efforts to recover its shoran capability, but in November of that year only 42 of 162 B–26's and RB–26's in that command were equipped with shoran.[119] Lacking electronic means of target identification and attack, the striking power of the B–26 was no more effective than the uncertain ability of the pilot's eyesight under conditions of restricted visibility.

Although armament on the B–26 night intruders was considerably increased by such expedients as addition of local adapters to permit carrying 100-pound bombs on otherwise unusable rocket positions and the installation of gun pods, the B–26 remained a generally unstable bombing platform. Because of structural limitations, moreover, the external load had to be dropped first, then the lower racks, and then the upper racks, meaning that weapons selection had to be done before the mission although it was impossible to determine what targets of opportunity would be sighted Thus aircraft loaded for locomotive attacks could not efficiently prosecute attacks on vehicular targets if such were sighted.[120] The Fifth Air Force naturally had no solution to a lack of proper denial weapons, which had never been developed in USAF, but it is evident that the night intruders did not always attempt to determine the type of ordnance best suited for their targets. A representative of FEAF noted at the Night Intruder Conference that the lack of officers qualified in weapons selection had "played a considerable part in the Far East in the misuse of weapons." [121] Because there was no valid means of assessing the results of night intruder attacks, the 1st ARDC task group believed that the Fifth Air Force should have selected intruder weapons on the basis of quantitative data obtained under controlled experiments and prior field assessments of weapons effects.[122]

Finally, combat crews who are properly trained and indoctrinated for night attack comprise an integral part of a night intruder system. Colonel Zoller noted that there was a tendency among Air Force personnel to do as little as possible in the way of night and instrument flying. The condition existed for many reasons: aircraft instrumentation was not up to a standard required to give crews the same confidence at night as in daytime flying, there had been a general unawareness of the necessity to maintain an around-the-clock capability in all phases of military aviation, military life and family life was too well indoctrinated to the concept of an "eight-to-five" working day From his experience with the 3d Wing, Zoller knew that human beings, by nature, fear anything that they cannot see, particularly if they know that they are in danger. He thought that such natural fears could be overcome only if the aircrews were convinced that they had proper equipment, had proper training and experience, and were performing a mission of importance [123]

†In August, October, and November 1952 three B-26's of the 90th Sq, 3d Bomb. Wg, were equipped with Infrared Detector Sets AN/AAS–1 and were tested with some small success. Although the set lacked target selectivity, had a short range of detection, and had numerous maintenance difficulties, it showed considerable promise for additional developmental work.

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SHORAN BOMBARDMENT

Establishment of the Shoran System: Cognizant that short-range air navigation radar, or shoran, had permitted bombing and photo reconnaissance at night or in limited visibility during World War II, FEAF had requested shoran-equipped B–26's and shoran beacons from the United States even before the onset of Korean hostilities. Basically, the shoran is a high precision position-finding navigation system comprising an aircraft equipped with a transceiver (AN/APN–3) and two or more ground beacons (AN/APN–2). The aircraft transmits signals to the two beacons, whose position and separation distance are known and which amplify and return the original signal to the aircraft set; by automatically measuring the time required for the radio signal to traverse the round trip the airborne set provides an accurate "two-circle fix." The shoran bombing computer used shoran data in much the same manner that the Norden bombsight utilized optical data, but necessary to shoran bombing are shoran coordinates for the bomb-release point which must be computed prior to a mission for each target to be attacked and for each altitude of attack.[124] As with all blind-bombing systems, the shoran procedure demands highly accurate maps.

At the outbreak of the Korean conflict the USAF shoran capability was the 1st Shoran Beacon Unit, stationed at Langley AFB, Virginia. This unit was hurriedly filled up to strength and dispatched to Japan, arriving via airlift on 18 August 1950 with a limited amount of equipment needed to establish only two beacons. Meanwhile, four APN–3 equipped B–26's were flown to Japan, and late in October 1950 unsuccessful efforts were made to run a bombing mission. This failure was due to the unit's inability to locate proper beacon sites during a period of fast ground advances, the general ineffectiveness of old equipment, and a lack of training among recently received filler personnel. When Korean test missions again failed on 11 December, the 1st Shoran Beacon Unit was dismantled and returned to Japan.[125]

Back at Iwakuni the unit was provided enough new equipment for two additional beacons, its old sets were given depot overhaul by FEAMCOM, and its personnel trained with the 3d Bombardment Wing. After six weeks of this reorganization and training, the unit was finally considered adequately qualified to perform its mission and was sent back to Taegu on 25 January 1951. Decision to locate two of the unit's beacons on offshore islands to the west of Korea caused several days' delay in getting operational, but on 4 February 1951 Able and Charlie sites were established on Tokchok-to and Taechong-do. Baker site had already been established on Usan-bong, a mountain about 15 miles north of Taejon. On 17 February reasonably successful shoran test missions were flown by the 731st Bombardment Squadron.[126]

Initial Shoran Missions: During April 1951 the 3d Bombardment Group extensively employed shoran for bombing operations against towns, bridges, and transportation chokepoints between the 38th and 39th parallels.[127] The shoran system lacked the flexibility of the MPQ–2, and because rigid computations were necessary mobile targets could not be attacked. The B–26's frequently met icing conditions or felt their lack of oxygen equipment at altitudes specified for attack.[128] In their initial establishment, moreover, the shoran beacons possessed a limited coverage of North Korea: on 19 June, after the Communist offensive had been driven back, Baker site was moved to Kuksa-bong, about 25 miles north of Seoul, where, paired with the Taechong-do beacon, it could extend shoran coverage as far north as Sinuiju.[129] In July the 3d Group got good results when shoran aircraft marked targets with fire bombs while other aircraft bombed visually, and in the first 15 days of August the 452d Group had 83.7 per cent effectiveness in 191 scheduled shoran missions.[130] The light bombers were well on their way to the establishment of a good shoran proficiency, but beginning in August 1951 these bombers were required to empha-

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size intruder missions against targets of opportunity flushed into the open by operations STRANGLE To maintain proficiency, shoran operators continued to utilize shoran equipment as a navigation aid on intruder missions.[131]

Thus far planning had visualized that shoran would be employed principally by the light bombardment groups, but the cloudy spring weather of April and May 1951 convinced the FEAF Bomber Command that its B–29 medium bombers required an electronic assist. During the summer of 1950 the medium bombers had used AN/APQ–13 radar to locate the well-defined North Korean industrial targets, but the inland targets and mud and thatch villages to be attacked in 1951 would not give adequate returns for this type radar; nor could AN/APN–60 and MPQ–2 radar be employed because ranges to targets were too great. In April 1951 Bomber Command thus found it practicable to install the AN/APN–3 shoran component in a medium bomber, and modification of the first nine B–29's began the following month. By 20 August the 3d Wing had trained the necessary personnel for Bomber Command's shoran operation and maintenance.[132] The first B–29 attack using shoran was flown by the 98th Bombardment Group on 1 June in order to determine whether a medium bomber could successfully fly a shoran arc without unreasonably long approach, steep bank, and excessive maneuvering When this test had indicated that shoran techniques were practicable within the limited area of Korea, the 307th Group flew its first mission on 23 June and the 19th Group on 9 July 1951 These initial missions were considered as training and were flown in excess to the 18 combat sorties being scheduled daily.[133]

Even with limited experience, the medium bombers got good results from daylight shoran bombardment. By way of comparison, six 98th Wing B–29's, bombing visually from 20,000 feet in clear but hazy weather, had a circular error of only 100 feet at the Hwangju marshalling yard on 11 July, on 26 July, 11 B–29's of this wing, bombing the Pyongyang main marshalling yard by shoran from approximately the same altitude in 9/10 cloud cover, had a circular error of 180 feet.[134] On 23 September the 19th Group, utilizing shoran to bomb through a 9/10 undercast, knocked out the center span of the Sunchon bypass railway bridge.[135] Not all shoran bombing was so accurate, but for the period 1 June through 30 September 1951 operations analysts figured the average circular error probable, excluding gross errors, to be approximately 485 feet with shoran.[136] In the cloudy summer skies of Korea shoran also provided assistance to visual bombing by locating initial points, fighter rendezvous points, and on one occasion one flight of B–29's, finding the Pyongyang marshalling yard partially cloud covered, killed rate with the bombsight and continued on the shoran arc to score a circular error of 55 feet. Bomber Command, however, felt that when a bomb run was committed to shoran and the 70° sighting angle had been reached, or the aircraft was closer than 15 miles to the target, under no condition should the run be taken over for visual bombing.[137] Bomber Command experience in the summer of 1951 thus demonstrated that shoran was adequate for prosecuting attacks against a cloud-shrouded primary target when the Norden sight could not function, and beginning in August two B–29's were scheduled nightly for shoran-guided attacks against enemy marshalling yards.[138]

Some readjustment and augmentation of the shoran stations was necessitated for the use of the medium bombers. The pair of beacons at Tokchok-to and Taechong-do, because of their close proximity, gave satisfactory coverage only up to a maximum of 100 miles, or 50 miles beyond the bomb line. The mountain-peak site at Kuksa-bong, when paired with either of the other two sites, gave greatly extended coverage, but the two possible station pairs nevertheless permitted a limited number of target approaches, which by August 1951 the Communists had begun to cover on significant targets with augmented antiaircraft fire and predatory MIG–15's. The Fifth Air Force therefore directed a consolidation of two training detachments then operating at Miho and Pusan and their establish-

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ment in a tactical usage as Dog site on a 4,430-foot mountain in east-central Korea called Hwangbyong-san This station became operational on 23 September, and, although plagued with Red guerrillas in its isolated location, gave the desirable near-90° angles when paired with Charlie beacon By September 1951 the shoran network had a range of 250 miles and targets had been computed for altitudes up to 29,000 feet [139]

Medium Bomber Night Shoran Operations: Reliance upon shoran for daylight attacks against enemy airfields, marshalling yards, and railway yards strapped the medium bombers to a pattern which would be hazardous once the Communists decided to make determined MIG–15 counterattacks. Utilizing shoran means that the B–29's were permitted only four approaches to a target and were limited to altitudes which could not be changed greatly because of the distance of many of the principal targets from the shoran beacons. The Reds evidently decided to concentrate their jet fighters against the slow and heavy B–29's between 18 and 28 October, when the mediums were attacking the enemy airfields being built at Saamcham, Taechon, and Namsi.* In one week Bomber Command lost 55 crewmen killed or missing and 5 aircraft shot down, which, compared with only 6 B–29's previously lost to MIG interceptors, proved a sudden and staggering blow [140] "Almost overnight China has become one of the major air powers of the world," stated General Vandenberg.[141]

There was some talk that the B–29 medium bomber was through in Korea, but such rumors did not reckon with the versatility of the SAC airmen and the already-demonstrated success of the shoran system for guiding bombers to such targets as lay within the restricted distances of North Korea Bomber Command flew its last daylight attack on 28 October, and thereafter its medium bombers would fly at night, aiming their bombs by MPQ–2 for ground-support attacks and by shoran for deep penetrations.[142] In a speedy transfer of equipment directed by General Weyland, the Fifth Air Force released 75 AN/APN–3 sets to Bomber Command, thus surrendering its own light bomber shoran capability.[143]

Conversion of medium bombers to night operations brought no change in the relative task priority of Bomber Command, which remained· 1) continued neutralization of enemy airfields in North Korea; 2) interdiction of key rail and highway bridges; 3) attacks on any lucrative marshalling yard target in North Korea. As a routine commitment, Bomber Command furnished one to three B–29's for MPQ–2 close ground support and one B–29 for a leaflet mission each night. After November 1951, Communist airfields in North Korea were kept unserviceable with little effort; closely watched by reconnaissance aircraft, these airfields required only occasional medium bombardment attacks. The greatest portion of available B–29 effort could therefore be concentrated against the bridge targets which comprised Bomber Command's share of STRANGLE, and during the intervals when these bridges were out, key marshalling yards and supply areas were brought under attack. In accordance with Fifth Air Force change of plans in operation SATURATE, Bomber Command in March 1952 assumed responsibility for keeping continuously unserviceable at least one bridge on the two key rail lines from Sinuiju to Sinanju and from Kunu-ri to Huichon [144]

In their shoran attacks against railway bridges, the medium bombers found these targets easy to destroy but perplexing objectives to keep unserviceable. Most major steel bridges had already been destroyed and the railway bypass bridges being used by the Communists were of wood construction, readily chopped down by 500-pound GP bombs fuzed .01 nose and non-delay tail, but almost as easily repaired by the Reds Bridges were attacked by bomber streams of from 6 to as many as 16 B–29's; the number of planes sent against single-bridge targets increased as the spring of 1952 wore on On 28 March, 47 medium bombers, in an especially heavy attack against a critical target, took out both railway

*See Chap IV, pp 129-30

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bypass bridges at Sinanju.[145] In view of the limited number of bridges marked for destruction in FEAF interdiction plans, the record of Bomber Command between 15 January and 12 April 1952—168 bridge cuts and 102 rail cuts made—indicated that Communist through rail traffic was well curtailed,[146] but the medium bombers blasted and the Reds repaired in one continuous cycle. After 22 April the mediums got greater efficiency in bridge attacks by modifications of nose fuze vanes which permitted 20-foot intervalometer settings and closer bomb patterns.[147] Further to improve efficiency, FEAF suggested the desirability of using B–29's for multiple shoran passes at small targets instead of allowing them to drop their entire load on one pass. It was thought that this procedure would increase the possibility of multiple bomb hits and keep the bombers over the area for a longer time, thus disturbing the enemy repair effort.[148] By this time, however, enemy opposition to the night B–29 attacks was improving so rapidly that the medium bombers, rather than extending their time over targets, were going to have to figure out procedures which would take the maximum force over a target in the shortest time interval.

The conversion of medium bombers to night operations was well managed, but Bomber Command nevertheless met problems, some incidental to the shoran system and others arising from night flying. The physical separation of the headquarters of Bomber Command and the computations section of the 1st Shoran Beacon Unit, the one being at Yokota in Japan and the other at Seoul in Korea, made for delay in laying on shoran attacks. Two methods were established for obtaining the data required for a medium bomber shoran attack: the most desirable when time was available was for Bomber Command to furnish a photograph of the target to Fifth Air Force, showing the exact computation point plotted with eight digit universal transverse mercator (UMT) grid coordinates, together with the station pairs and altitudes which were desired for use. When this photo was received via Fifth Air Force at the computations section in Seoul, it was scaled and plotted on a 1:50,000 map and the necessary computations calculated. These computations and the photo were then returned to Bomber Command, where, after they were again checked and found correct, they were dispatched to the bomber wings. This method required nearly a week, but held advantages in that figures were thrice checked and information could be passed by courier with less chance for error than in radio or telephone transmission. When a target not previously computed had to be quickly scheduled, Bomber Command telephoned a request to its liaison officer at Fifth Air Force, who set the process in motion at Seoul. Even with such expedited action, six to ten hours were necessary before one set of computations using one station pair could be telephoned back to Bomber Command, and thence relayed by radio or telephone to the bomber wings. The process of securing shoran computations was thus either slow or else had the possibility of garbles in electrical transmission.[149] The length of time required for processing and transmitting shoran computations would have seriously impaired the usefulness of the system had a war of movement been under way in Korea, but there was a possibility that high-speed computing equipment might have shortened the lengthy prestrike calculations.[150] At any rate, the 10-hour period of computation at Seoul plus the additional amount of time required by Bomber Command to lay on a shoran mission was thought by FEAF to be "impressively long," and in April 1952 that headquarters, in order to reduce to an absolute minimum the elapsed time between target selection and Bomber Command attack, was attempting a step analysis of the whole procedure.[151]

A more severe limitation to the effectiveness of shoran, and one which would additionally lengthen the process of computing data, was that the necessary calculations could be no more accurate than map measurements of target locations. When shoran bombing was begun in Korea and for a considerable time afterwards, target coordinates were scaled from existing large-scale maps, which had

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been based on the Japanese Imperial Land Survey. Errors of up to 500 feet were common in these 1:50,000 scale maps, errors of up to 1,000 feet were not uncommon, and one instance was found where a map-feature was one-half mile off. Where crews dropped in succession at some distance from the geographical aiming point, it was fairly evident that mapping measurements were incorrect.[152] Coordinates for subsequent strikes on a target were sometimes adjusted to compensate for an obvious map error, but due to an inability to isolate each of several other possible errors which might have contributed to the original bombing inaccuracy such adjustments were largely unsuccessful The problem was finally solved by obtaining coordinates with multiplex stereoplotting equipment, by which means aerial mapping photography was referenced to geodetic control One series of maps, the 1:25,000 scale Emergency First Edition AMS (FEC), was produced by multiplex to cover an area approximately 60 miles beyond the front lines. If the target lay outside this coverage, however, it was necessary to compute its exact coordinates by especial multiplex methods.[153] Due to fortunate circumstances (USAF does not normally have available personnel and equipment needed for multiplexing, and dense geodetic control such as was available for Korea is abnormal) the Topographic Branch of Far East Command could handle requests for multiplexed coordinates,* but the necessity of adding FEAF and the FEC to the process of securing shoran computations also added to the possibility of errors in coding and decoding and slowed an already complex system.[154]

*The shoran reconnaissance recorder RD-25/APA-54, which should in theory have provided an alternative to multiplexing, could not be used to determine shoran target coordinates because of the lack of an accurate, operationally feasible, method of determining the nadir point of the recorder-equipped aircraft and because the basic accuracy of the recorder-shoran system was only 75 to 100 feet Since some targets were located as far as 225 miles from the ground beacons, the aircraft carrying the shoran recorder would have had to operate at approximately 25,000 feet The best stabilized camera mount could maintain a vertical accuracy within one degree, but from 25,000 feet this could cause a 450-foot error in locating a ground point (*See* Rpt, 1st ARDC Task Group, 1 Sept 1952, Tab HIO2.)

These delays in securing shoran computations necessary for bombing attacks would remain with Bomber Command during the remainder of the conflict and could thus be counted as somewhat inevitable to the system under the local conditions. What seemed even more alarming to the command as it began full-time shoran operations was the observation that its bombing accuracy, instead of improving with additional practice, was evidently worsening During summer operations of 1951 the shoran CEP had averaged approximately 485 feet, but for the period 1 October through 18 November it reached 1,220 feet against Namsi, Taechon, and Saamcham airfields and was assessed at 640 feet against other targets The principal cause of the reduced accuracy was undoubtedly an abnormally large periodic rotation of skilled shoran operators; quite probably the shoran operations against the airfields were also made less accurate by the small station angles available, some degree of mapping error, and a concentration of hostile flak and searchlights along the bomber paths leading to the fields. An emphasis correctly placed upon improved shoran training led to greater accuracy· from February through April 1952 Bomber Command posted an average CEP for scored bombs of 639 feet In April, moreover, it reduced its shoran CEP to 350 feet for a skilled crew under non-combat tests, and by May 1952 Brig. Gen Wiley P Ganey, commanding FEAF Bomber Command, was expecting to realize an average shoran circular error of 300 feet. "I feel," he stated, "we have already obtained bombing accuracy with our night shoran tactics that approximate our previous visual daylight formation standard, and with increased experience and development of the shoran method we will produce results in Korea that will surpass those obtained during daylight operations." [155] For the period April through July 1952, Bomber Command quoted a CEP of 450 feet, a figure which would have run somewhat higher had it included gross errors. In these several months, however, the 19th Group had CEP's of 508, 599, 510, and 800 feet respectively, scoring all bombs dropped. Such ac-

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curacy compared favorably with the results of World War II visual bombing.[156]

More than to any other factor the increased accuracy of B–29 shoran bombing was attributable to shoran-operator training programs conducted by the Bomber Command. Statistics showed that operators with the highest number of shoran runs had the smallest circular errors; it was also notable that the claimed malfunction rate against shoran equipment was roughly inversely proportional to the level of operator skill, new operators not infrequently reporting that ground stations were not on the air when other seasoned operators were simultaneously using them. At first the Bomber Command had to give new crews all of their shoran training; based on a calculated prediction that a successful shoran operator must have had at least 35 releases, the command gave as many training drops as possible. The press of operational commitments allowed the newly arriving shoran operator 8 practice drops in December 1951 and 15 in January 1952; eventually Bomber Command was able to allow 20 practice drops but this was as high as it could go, the other 15 drops required to establish proficiency had to be obtained in combat This meant that the average shoran operator was not fully effective until he had been in the theater for at least three months.[157] Beginning in August 1952, SAC replacement crews sent to the Far East would have had up to 20 practice drops, thus greatly decreasing the training load of the FEAF Bomber Command.[158]

Since it was necessary for scheduling the limited medium bomber effort and for maintaining its combat proficiency, the FEAF Bomber Command laid heavy emphasis upon bomb damage assessment and post-strike reconnaissance, so much so in fact that an impatient Fifth Air Force staff officer commented, "They hit a target and then they won't go back until they see the photos."[159] With the beginning of night shoran strikes against North Korean transportation systems, Bomber Command met difficulties in assessing damage: the remarkable recuperability of transportation meant that there was not enough time for the normal two- or three-day intervals between strike, reconnaissance, and bomb damage assessment, and there was need for something to replace visual crew reports, which could not be accurate for night strikes. In February 1952 the 98th Bombardment Wing therefore devised camera and flash-bomb installations, permitting each of its bombers to take strike photographs. The wing used K–37B cameras which were designed for night photography, with photoelectric shutter trip controls, together with M–46B photo-flash bombs mounted in the bomb bays and fuzed to permit their bursting before the first GP bomb impact and at least one camera cycle after the last demolition bomb impact.[160] The chief limitation to this arrangement was that the M–46B was not well suited to high altitude; beginning in June 1952 Bomber Command received shipments of M–120 flash bombs which had sufficient candlepower to allow maximum-altitude photography.[161] Strike photography taken by this installation was by no means completely suitable for BDA since smoke and dust raised by high-explosive bombs obscured determination of specific damage to pinpoint targets. It was nevertheless sufficient to reveal whether bombs had missed the target area (in which case no photo reconnaissance follow-up was needed) or that they were on the target.[162] These strike photographs were not of sufficient quality to replace post-strike reconnaissance but they provided a constant incentive in the building of individual crew proficiency and morale.

At first as the B–29's began night operations the Communists had no effective means of opposing them, but they soon began manning night defenses covering the possible approaches to key shoran targets. With increased UN night air operations, the enemy stepped up night-fighter sorties.* In December 1951 two night shoran attacks against Uiju airfield were vigorously opposed by coordinated defensive measures; radar-con-

*See Chap. IV, pp 110-11.

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trolled searchlights at the Sui-ho reservoir picked up the B–29's and passed them from battery to battery of lights all the way to Uiju, while cooperating fighters damaged three B–29's On the latter of these two attacks a 3d Group B–26, coordinating its efforts with the medium bombers, destroyed eight searchlights but lacked the ability to suppress all of the many lights along both sides of the Yalu.[163] By February 1952 the enemy was increasing his defensive capabilities farther south, particularly at the Sinanju bridge complex and along the Kunu-ri to Manpojin rail lines. At Sinanju flak guns covered all possible shoran approaches except one, this being northeast along the Chongchon River, but on both banks from the coast to the target the Reds had emplaced radar-controlled searchlights. During May the number of heavy flak guns in North Korea increased from 343 to 383 and night-fighter sightings rose from 17 in April to 50 in May. On the night of 10 June, when four 19th Group bombers were attacking the Kwaksan railroad bridge complex in clear weather along the only suitable shoran approach, Communist night defenses destroyed their first planes. Searchlights locked on each successive B–29, coning them while at least 12 jet fighters prosecuted attacks apparently under the direction of an air controller who flew a course parallel to the bombers: one bomber exploded over the target, a second went down from fighter attack, a third received such major damage that it was forced down at Kimpo, while the fourth, successfully jamming searchlights with its electronics countermeasures, escaped unscathed.[164]

Bomber Command had already been working on measures to reduce the advantages permitted to enemy defenses by the inflexible shoran arcs. After Uiju it had first settled upon a remedial tactic of using several shoran arcs with staggered times and altitudes for each attack, thus presenting a less predictable bomber stream to the enemy. This procedure considerably complicated a multi-plane shoran mission, especially at the wing level, since individual shoran computations and flight plans were required for each aircraft.[165] Desiring to strike enemy aircraft at the hotly-defended Sinuiju airfield, Bomber Command had picked the night of 26 January 1952, when a 10/10 undercast completely baffled searchlights as the 98th Group attacked.[166] Electronics countermeasures were emphasized, with each B–29 being equipped to jam all known and suspected frequencies.

After the Kwaksan losses, Bomber Command redoubled its efforts to solve the menace of enemy night defenses Medium bomber gunners, for example, had been coached not to fire lest their gun flashes disclose their positions, but now the Far East Air Logistics Force (formerly FEAMCOM), putting its whole staff to work, had 4 locally designed flash suppressors for B–29 guns ready for test within 48 hours SAC and FEAF authorized the underside painting of B–29's with shiny black lacquer to make pickup and tracking more difficult. Bomber Command requested and FEAF directed the Fifth Air Force to develop searchlight-suppression tactics and to attack the airborne enemy commanders of night interceptors; FEAF also suggested that Fifth Air Force investigate the use of smoke for searchlight suppression and the employment of low-flying aircraft to harass such enemy installations. Bomber Command itself announced the determination to attack hotly-defended searchlight areas only when one or more cloud layers were over them. It requisitioned sufficient equipment to jam all searchlight control radar frequencies, expedited the installation of B–50 aircraft tail-gun turrets, and sought unsuccessfully to obtain permission to employ HAIL missiles* against searchlight areas[167] Devising the maximum protection for its medium bomber night attacks would remain the major operational problem of the FEAF Bomber Command in the months following June 1952.

**See Chap. VII, p. 217.*

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Chapter VII

AIR-GROUND ACTION IN KOREA

"I would say the support that our tactical air has given to our ground troops in Korea has perhaps never been equalled in the history of modern war," General MacArthur informed interrogating Senators in 1951.[1] To a command assemblage in April 1951, General Ridgway stated that he fully appreciated, as he believed was universally recognized, that FEAF had enabled the Eighth Army to stay in Korea in the early days of the war and had subsequently made outstanding contributions to the defeat of Communism in Asia.[2] "During the entire time I was in command in the Far East," wrote General Mark W. Clark, "the front-line infantry units and tactical air support units worked closely together in Korea, and understood and respected each other's problems. When the foot soldier needed close air support, he got it." [3] Thus spoke the three commanders-in-chief of the United Nations Command regarding the effectiveness of air support of ground operations in Korea. That close air support was generously furnished both in terms of sheer quantity and in comparison with other air endeavor is shown in figure 14.

Notwithstanding a general agreement that air support was effective, a ferment of ideas was abroad in Korea, especially during 1950 and 1951, that the system of close support could be "improved." That the initial improvisations in Korea could be and constantly were improved was a major concern of USAF airmen; they were nevertheless unwilling to believe that the doctrinal and organizational lessons derived from much more extensive campaigns in World War II were to be overthrown because of situations obtaining in the peculiar Korean conflict. As the Korean fighting dragged on the USAF viewpoint was justified: legitimate ground force criticisms dwindled as the men and means became available to fill out the close-support system required in existing doctrine.

DEVELOPMENTS OF THE TACTICAL CONTROL SYSTEM

The Improvised System: As has been seen in an earlier study,* the Fifth Air Force improvised with commendable speed a tactical control system permitting air-ground coordination from the earliest days of Korean fighting. Touring Korea as a representative of the Army Field Forces, Brig. Gen. Gerald J. Higgins, director of the U.S. Army Air Support Center, thought it "highly significant that the Commanding General, Fifth Air Force, was apparently the first individual in the theater to recognize, and take steps to implement, the necessity for coordination of the efforts of the air and ground troops." [4] The improvised system was fundamentally hampered by a lack of communications equipment and trained personnel. When the Eighth Army was unable to provide its air-ground operations net for forwarding requests for air support from ground divisions, the Fifth Air Force had attempted to fill the function with SCR-399 high-frequency radio parties, and when this improvisation frequently failed, the Air Force tactical air control parties (TACP's) commonly forwarded requests over their radio fighter-control nets. To provide central di-

*See AHS-71, pp. 23-31.

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KOREAN OPERATIONS:

USAF DAILY AVERAGE SORTIES BY TYPE

25 June 1950–18 June 1951

Phase	I	II	III	IV	V	VI	VII	VIII	IX	X
Total Sorties	16,457	8,890	6,322	10,278	8,202	7,979	9,184	9,032	12,534	16,715
Daily Average	316	523	486	605	586	499	612	602	569	643
Daily Av Close Support	157	182	193	222	108	116	137	119	97	120
% of Total	49	35	39	37	18	23	22	20	17	19
Daily Av Interdiction	81	148	117	146	197	109	186	169	232	254
% of Total	26	28	24	24	34	22	31	28	41	39
Daily Av Strategic .	6	21	8	9	5	0	0	0	0	0
% of Total	2	4	2	1	1	0	0	0	0	0
Daily Av. Other	72	172	168	228	276	273	289	314	240	269
% of Total	23	33	35	38	47	55	47	52	42	42

Phase	XI	XII	XIII	XIV	XV	XVI	XVII	XVIII	XIX
Total Sorties	10,942	14,180	4,659	19,212	19,972	7,213	11,694	11,795	13,542
Daily Average	729	709	582	768	768	801	731	786	752
Daily Av. Close Support	82	125	96	175	99	131	68	115	67
% of Total	11	18	16	23	13	16	9	15	9
Daily Av Interdiction .	338	277	208	236	302	286	287	244	249
% of Total	47	39	36	31	39	36	39	31	33
Daily Av Strategic	0	0	0	0	0	0	0	0	0
% of Total	0	0	0	0	0	0	0	0	0
Daily Av. Other	309	307	278	357	367	384	376	427	436
% of Total	42	43	48	46	48	48	52	54	58

PHASES USED IN THE TABLE REPRESENT:

I—Initial retreat of UN Forces in Korea (25 June–15 August 50)
II—Build-up of UN strength (16 August–1 September 50)
III—The Naktong River Battle, turning point (2 September–14 September 50)
IV—The Inchon Landing and subsequent Offensive (15 September–10 October 50)
V—General Advance of UN Forces (2 October–15 October 50)
VI—UN Offensive North of 38th Parallel (16 October–31 October 50)
VII—Chinese Forces make appearance in North Korea (1 November–15 November 50)
VIII—Chinese Build-up (16 November–30 November 50)
IX—Strategic withdrawal of UN Forces (1 December–21 December 50)
X—Stabilization of UN Lines (22 December–16 January 51)
XI—Extensive UN Patrol activity (17 January–31 January 51)
XII—Abortive Enemy Counter Offensive (1 February–20 February 51)
XIII—Regrouping (21 February–28 February 51)
XIV—UN Operation "Killer" (1 March–25 March 51)
XV—Enemy Resupply (26 March–21 April 51)
XVI—Enemy Spring Offensive (22 April–30 April 51)
XVII—Enemy Resupply (1 May–16 May 51)
XVIII—Enemy's 2nd Stage Spring Offensive (17 May–31 May 51)
XIX—UN Counter Offensive and Pursuit (1 June–18 June 51)

Figure 14

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rection for tactical air control, a joint operations center (JOC) had been established comprising the Air Force combat operations section and the Army air-ground operations section; the tactical air control center (TACC), located adjacent to the JOC, furnished communications for the control of supporting aircraft. After much confusion due to the vagueness of extant doctrine, Navy representatives had finally agreed to serve with the JOC, regulating carrier-based supporting air through a radio net with Task Force 77.*

In the field, for the control of aircraft in close-support strikes the Fifth Air Force had provided four TACP's with each division (a number permitting one TACP with each regiment and one with division), air liaison officers (ALO's) with divisions and corps, and additional tactical air coordinators (TAC's) with T–6 Mosquito aircraft had been provided for the airborne control of close-support aircraft A functional chart of the JOC and the tactical control system is shown in figure 15. While the JOC, through the TACC, should possess direct communications with wing airdromes, permitting it to scramble aircraft for a close-support mission, such was frequently not the case in Korea, especially in the early months when communications channels were scarce and air units were based in Japan. Planes were therefore dispatched at periodic intervals, and upon entering Korea the pilots called the TACC for a mission assignment to a specific TACP, usually the TACP at a division would receive the fighters and allocate them to a regimental TACP or to a Mosquito controller.

Arrival of the USAF 502d Tactical Control Group and the Army 20th Signal Company, Air-Ground Liaison, in Korea during October 1950 vastly improved the communications problems. Upon reaching Korea the 502d absorbed the personnel of the 6132d Tactical Air Control Group (P) on 10 October, but the 502d nevertheless had some difficulty getting into operations. Just before its embarkation from the United States the group had been stripped of its transportation; moreover in 1947 one aircraft control and warning squadron (AC&W) had been deactivated for economy, so that two tactical air direction centers (TADC's) had been administered by the same squadron.[5] When the 502d Group reached Korea the 6132d AC&W Squadron was therefore activated as a third squadron to the group's 606th and 607th AC&W Squadrons. The 605th Tactical Control Squadron took over the operation of the TACC; while the 502d Group's three AC&W squadrons manned TADC's at Kimpo, Taegu, and Taejon.[6] According to doctrine, the TADC is a subordinate air operations control center from which aircraft and air-warning operations are normally directed in restricted areas; it is the operational component of a tactical control group operating at corps or amphibious group level. Although the 606th AC&W Squadron moved to Sinanju and the 6132d went to Pyongyang in November 1950, and the 607th functioned at Kimpo, the three squadrons merely furnished early warning and direction-finding services without undertaking offensive fighter direction.[7]

There were a number of valid reasons why Fifth Air Force chose not to employ the offensive radar capability of the TADC's during the fall of 1950. The equipment was burdensome to move over Korean roads with scanty transportation; prevailing good weather permitted visual observation and direction by TACP's and Mosquito aircraft; shortage of communications equipment in Korea compelled the taking of most of the 502d Group's point-to-point apparatus for other purposes; and finally the existing control system was working and there was no apparent reason for putting aircraft through another control cycle at the TADC level.[8]

Air operations under the centralized direction of the JOC through the TACC had been suitable in the restricted area of South Korea, where distances were short, but as the ground fighting approached the Manchurian border, VHF radio channels were increasingly strained. Initially, however, Eighth Army in its offensive had little need for close support and the difficulty was not immediately perceived. The Chinese attacks of 25 November

*See Chap III, pp. 75–76.

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JOINT OPERATIONS CENTER

FUNCTIONAL CHART

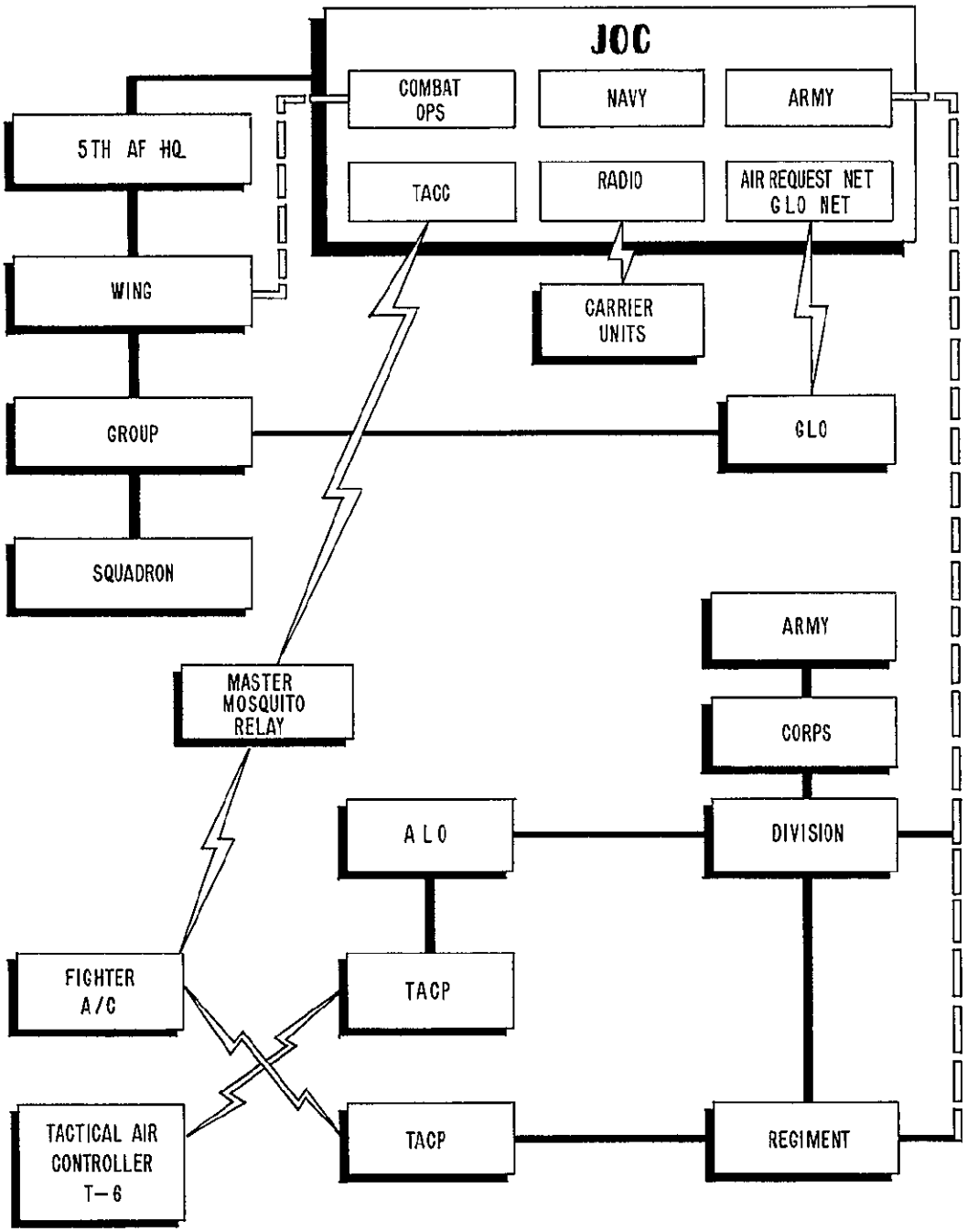


Figure 15

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1950 and 1 January 1951, however, revealed the great weakness in the overextended tactical control system: the delay in the tactical air direction net, particularly for the close-support operations inside the bomb line. Target-bound close-support flights reported to the TACC, were instructed to report to a specified divisional TACP, and there were further directed either to a regimental TACP or to the Mosquito over the division. In the event the TACP at a division had no targets, the flight was at liberty to seek a target from the JOC or from any other controller who had a target; conversely TACP's who needed flights were authorized to request support from any flight not assigned to another TACP. Communications difficulties were encountered because the TACC could not always be contacted by a flight in northern Korea. Therefore, a Mosquito T–6 control ship was utilized to orbit midway between the TACC (located first at Seoul and then at Taegu) and the front. This Mosquito, however, could relay messages only on Channel A, the channel on which all flights had to report into and out of TACP's and which usually became quite crowded. As a result of these two factors, a flight released by a TACP usually had long delays in finding another TACP which needed help and was often unable to contact the TACC. A control system decentralization to TADC's would have alleviated these communications difficulties "While it is true that only during the two major attacks by the Chinese did the inflexibility of the control system hinder the effectiveness of operations by Fifth Air Force," concluded a USAF evaluation board, "it is equally true that this inflexibility constantly jeopardized full utilization of that air force's effort." [9]

When the ground fighting had moved backward to the vicinity of the 38th parallel the Fifth Air Force system for close-support control was no longer overextended, and, in view of the crowded battle area in South Korea, the Fifth Air Force saw no reason to employ the TADC's in offensive aircraft control during daytime operations. The 502d Tactical Control Group was again deployed in rearward positions: during January 1951 the 605th Squadron manned the TACC at Taegu, the 606th, 607th, and 6132d AC&W Squadrons operated warning radars and direction-finding facilities at Pusan, Taejon, and Taegu. In order to eliminate the communications bottleneck between the TACC and the front lines, the Fifth Air Force put into operation on 26 January 1951 a C–47 airborne relay aircraft, equipped with ARC–28 VHF relay and a four-channel VHF radio set. This Mosquito control aircraft normally maintained station approximately 20 miles behind and parallel to the front line during all daylight close-support operations. The primary function of this radio relay C–47 was to pass messages between TACP's, airborne controllers, fighter bombers, Mosquito combat operations, and the TACC.[10]

The tactical air control system set up by Eighth Army and Fifth Air Force followed the Joint Training Directive for Air-Ground Operations, prepared jointly by the Office, Chief of Army Field Forces, and Headquarters, Tactical Air Command, and issued 1 September 1950. That this directive was "sound and adequate, and . . . applicable to the Korean theater of operations" was attested by a Joint Fifth Air Force-Eighth Army Air-Ground Operations Board which reported on 26 March 1951.[11] While this board generally endorsed the system as it was functioning in Korea, it stressed a number of desirable remedial actions required fully to exploit the extant doctrine. During 1951 steps were taken in Eighth Army and Fifth Air Force to secure and utilize the means and equipment required to bring the tactical air control system to its maximum level of efficiency.

The Air-Ground Operations System: According to doctrinal terminology the air-ground operations system (AGOS) consists of fully trained army personnel with necessary equipment for participating in air-ground operations at all echelons of army command and at airfields of tactical air units. The AGOS, in other words, is the army contribution to the tactical air control system both in personnel and in communications equipment. For several months after the begin-

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ning of the Korean operations it would appear that the Eighth Army's AGOS was somewhat loosely ordered due primarily to shortages of personnel and equipment which were even more acutely felt and more slowly remedied than similar problems on the Fifth Air Force side of the system.

When Eighth Army had been unable to provide a necessary air request net between divisions and the JOC, the Fifth Air Force had loaned SCR-399 radio crews; in March 1951 the Joint Air-Ground Operations Board considered that this net was "generally dependable," but it noted that Eighth Army units were having considerable difficulty in passing air requests within the division Usually air requests within the division were forwarded by land line or by radio over the division command or artillery communications net, but, when units within the division were extended beyond the capability of these communications systems, air requests were relayed over the VHF tactical air direction net from the TACP to the Mosquito to the division TACP, or directly to the JOC. Such a procedure was understandable in an emergency and had been frequently used in the early days in Korea and in the withdrawal from the Yalu, but it prevented proper screening and processing of air requests at regiment, division, and corps, and also overloaded the tactical air direction net At the recommendation of the joint board, the Eighth Army agreed to limit such use of the tactical air direction net to genuine emergencies.[12] By early 1952, moreover, the Eighth Army had replaced the high frequency radio equipment (SCR-399) and utilized AN/GRC-26 radio-teletype between the divisions and JOC for requesting air strikes.[13]

The Joint Air-Ground Operations Board also noted a considerable variation in the procedures utilized within Eighth Army units in processing and approving requests for air support. At its recommendation the Eighth Army agreed to make the G-3 Air officer at corps and division level a full-time job and to provide sufficient personnel to permit a 24-hour schedule of operations. Investigations of the board determined that all ground units possessed fire support coordination centers (FSCC's) but that the actual location of such centers varied with the prerogative of the local commander; the board noted that the final decision as to whether a given target should be attacked by air or artillery or both rested in theory with the FSCC at division level but that such a practice was not always being followed in Korea.[14]

The Tactical Air Operations System: By doctrine the Air Force contribution to the air-ground cooperation organization is the tactical air operations system which provides a tactical air force commander with the organization and equipment to plan, direct, and control air operations. While this tactical air operations system comprehends the personnel and equipment ranging from the front lines back to include the JOC, most of the difficulties in Korea were met in the most forward elements of the system: in the TACP and Mosquito air coordinator functions.

During the spring of 1951 the Fifth Air Force integrated both of these forward control functions into a provisional group of a type not previously known in the USAF. In October 1950 with the arrival of the 502d Tactical Control Group, the TACP function had been incorporated into the 6132d AC&W Squadron, but because of the wide variance of this function from the other duties of an aircraft control and warning squadron, it was soon advisable to locate the TACP's in a separate squadron. On 25 December 1950 the Fifth Air Force therefore activated the 6164th Tactical Control Squadron, attaching it to the 502d Group for all purposes.[15] The Mosquito tactical air coordination function had experienced a separate organizational existence, beginning on 1 August 1950 when the Fifth Air Force had organized the 6147th Tactical Control Squadron, Airborne. In discussions before the Joint Air-Ground Operations Board in March 1951, the Eighth Army stated the requirement for 12 T-6 Mosquito aircraft (one per division) to be kept continuously on station, with an additional back-up for emergency actions.[16] Facing the facts that the TACP function did not fit in with the work of the 502d Group and that there was an ad-

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ditional requirement for Mosquito control teams, the Fifth Air Force on 25 April 1951 established the 6147th Tactical Air Control Group (Provisional), including the 6148th and 6149th Tactical Control Squadrons (Air), the 6150th Tactical Control Squadron (Ground), the 6147th Air Base Squadron, and the 6147th Maintenance and Supply Squadron. Personnel for the new units was drawn from the redesignated 6147th Squadron, the 6148th Air Base Unit, and the discontinued 6164th Squadron.[17] Establishment of the 6147th Group with station at Pyongtaek (K–6) and after April 1952 at Chunchon (K–47) provided a desirable organizational framework for airborne coordination and forward air control of close-support air strikes, but it did not solve personnel and equipment problems of the two functions.

By doctrine, the tactical air control party is designed for the control of aircraft strikes from forward observation posts; it may operate at division, regimental, or battalion level. Although the number of TACP's to be utilized was a continuing point of contention,* the Fifth Air Force maintained one TACP with each United States and British infantry regiment and higher unit headquarters engaged in normal infantry operations and one TACP with each ROK division and corps headquarters.[18] The number of TACP's in the field at a given date therefore depended upon the ground order of battle; in January 1951, 43 teams were in the field, and in early October 1951, 49 were operating with friendly ground units.[19]

Personnel assigned to each team were a pilot officer forward air controller (FAC), an airman radio operator and another airman radio mechanic. The two airmen were furnished by the 6150th Tactical Control Squadron and its type predecessors, but from the outset of Korean hostilities the FAC had been a fighter or light bomber pilot, serving at first 21 days' and then (after February 1951) 60 days' temporary duty from his flying organization The longer period permitted more thorough orientation of the pilot in FAC duties at the 6150th Squadron and decreased the burden upon the flying units; it also allowed time enough in the field for the pilot to gain experience and acclimate himself to combat conditions The extended period, however, depressed pilot morale. whereas an 18th Group pilot could finish his normal flying tour in a little more than three months, a pilot who drew FAC duty could expect a six months' tour. According to February 1951 criteria, the pilot selected as FAC had some 20 to 40 missions to his credit; during the 60-day FAC tour he not only lost this flying proficiency and flight pay, but when he returned to his organization to complete his 100 missions, he found a changed tactical situation and often entirely new people with whom he had to fly.[20] To remedy this situation, the Fifth Air Force on 1 October 1951 instituted a new procedure whereby all pilots used to perform FAC duty were furnished by the two Mosquito squadrons of the 6147th Group. This system worked well and improved the caliber of the FAC, since he normally flew a number of Mosquito missions before being assigned to the ground-control duty.[21] A pilot was normally assigned to FAC duty for approximately 80 days, a period which included his orientation training.[22] Airmen members of the TACP were subject to normal personnel rotation; in July 1951, when there was some protest that airmen subjected to the same conditions as front-line soldiers were not allowed the six months' rotation accorded soldiers, Fifth Air Force stated a policy that the TACP airmen might be rotated to some other duty within Korea after six months' TACP duty. None of the airmen desired to exchange their assignments for some other uncertain duty in Korea.[23] Improved personnel proficiency and availability, however, enabled the 6147th Group to rotate airmen after 60-day tours with a TACP, although they might serve several tours during their time in Korea; on 10 June 1952 a further increase in the level of skill permitted the rotation of TACP airmen after 52 days at the front.[24]

The communications equipment available to the TACP's limited their effectiveness and in good part determined their tactical employment. In the early stages of the Korean con-

**See* pp. 202-5

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flict F–51 aircraft equipped with SCR–522 (four channels) and TACP jeeps carrying AN/VRC–1 (four channels) had been permitted only three possible air-ground channels of communication, since channel D was reserved for emergencies. Tactical air operations, however, require that each tactical group use separate group common facilities for primary-strike and control-tower operations Early in the Korean war many close-support strikes had to be worked on the emergency channel [25] As time passed, the fighters were retrofitted with AN/ARC–3, eight-channel VHF radios, but modification of the TACP jeep was a more complex matter, since it involved shock-mounting of equipment designed for aircraft, supplementing the jeeps' springs to carry heavier loads, and providing a heavy-duty generator. Equipment to be installed included an AN/VRC–3, consisting of the SCR–522, the AN/ARC–3, the AN/ARC–8, and associated power and remote equipment The pilot-model of such a TACP jeep was completed by FEAMCOM in February 1951 and production of others was assigned an A–1 priority.[26] Because of parts shortages full-scale production could not begin until April 1951, but a number of the VRC–3 jeeps went to Korea that month, and by 5 June all TACP's in the field were equipped [27] Operations then commenced under a new frequency plan: 10 separate frequencies were now allocated as unit tactical common and tactical air direction frequencies, one being assigned to each fighter wing, to Marine aircraft, and to naval carrier forces. The other two channels were utilized as universal military air-traffic control (MATCON) and as a joint reporting in-and-out (RIO) frequency The supporting aircraft made initial contact with the TACP on the RIO frequency and then both shifted to the group unit tactical common as the tactical air direction working frequency.[28] The new signals capability vastly improved communications between air and ground at the front lines, but as was expected the locally designed equipment gave a great amount of trouble In July 1951 the 6147th Group recommended that the TACP jeep be provided with an aircraft generator rather than the arc-welder prototype installed by FEAMCOM, the substitute being 200 pounds lighter and designed for continuous operations; such a modification was installed in jeeps reaching Korea after October 1951.[29] The TACP jeep at no time during operations in Korea was a satisfactory installation for the purpose; it was rough on the fragile electrical equipment, frequently out of order for mechanical reasons, and was at once too small for the paraphernalia of the control party and too large to approach forward observation posts

It was the accepted policy of regimental commanders in Korea normally to keep the TACP in the immediate vicinity of their command posts In the same area was the regimental fire direction center, and the FAC and artillery liaison officer were prepared jointly to advise the regimental commander on support available to him.[30] Since the regimental command post was normally some distance from the front lines, it was impossible for a FAC to control an air strike visually from such a point. In controlling an air strike the TACP had to station itself somewhere within the regimental zone where it had dependable and immediate communications with the artillery battalion fire direction center. Employment of the TACP at the artillery battalion fire direction center facilitated coordination of air strikes with artillery fire, but from such a location it was again impossible for the FAC visually to control a strike aircraft The TACP could be employed at the infantry battalion level only when ground communications were maintained to the artillery battalion fire direction center. The best location for a FAC permitting visual control was the artillery battalion observation post, where both a view of the target area and artillery communications back to the fire direction center could be had. In view of the mountainous terrain, however, it was all but impossible for a TACP to get its jeep-borne communications up to a forward observation post [31] Arrival of sufficient numbers of portable AN/TRC–7 radio sets in July 1951 offered FAC's some possibility of directing

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strikes from remote points of vantage, but these sets had a serious limitation in that they had only two communications channels.[32] At the recommendation of the Joint Air-Ground Operations Board, General Partridge on 11 April 1951 put in a requisition for enough MAW–8 VHF portable radios to equip his TACP's. These sets had 10 channels of communication and could be carried forward to an observation post.[33] Apparently these sets could not be readily obtained for not until April 1953 did the Fifth Air Force secure 50 MAW–1, 10-channel radio sets, permitting replacement of the AN/TRC–7 sets which were still in use at that time.[34]

In view of these problems confronting ground control of close-support aircraft, it was not strange that the Mosquito tactical air coordinators actually directed the vast majority of strike aircraft to their targets: as of January 1952 some 93 per cent of close-support missions had been directed by Mosquito aircraft while only 7 per cent had been directed by a TACP.[35] Originally the Mosquito function had been established to insure that ground targets would be found and pointed out to fuel-hungry jet fighter-bombers with a minimum of delay. The peculiar lack of enemy opposition to aircraft had permitted the Mosquito aircraft during 1950 to roam the front lines at low altitude with near impunity and they had often penetrated as much as 50 miles behind the enemy lines seeking targets for friendly fighters. When the Chinese Communists entered the conflict, however, hostile antiaircraft fire was increased and the T–6's were generally limited to the front lines, where they became an increasingly integral part of the close-support system.[36] To spot targets in the area behind enemy lines, the Fifth Air Force in March 1951 required the 45th Tactical Reconnaissance Squadron to institute "Hammer" missions, whereby F–51 reconnaissance aircraft kept daily surveillance and called in friendly fighters to attack targets of opportunity.[37]

Ordinary tactical employment of the Mosquito aircraft kept five of them on station over the corps areas at the front lines between first- and last-light. In fluid situations as many as 12 Mosquito aircraft were on station at the same time. Each Mosquito mission averaged approximately two and one-half hours in duration. Arriving on station, the Mosquito reported directly to a corps for subsequent work assignment to a division, where its task was visual reconnaissance of possible enemy targets, either as requested by the division TACP or as voluntarily made by the Mosquito. If a close-support strike was to be made, the ground TACP and the Mosquito worked in close cooperation: the former coordinated artillery fire, requesting it to mark the target with colored smoke when necessary or to hold fire if this were required, and requested front-line infantry elements to mark their positions with panels; the latter "talked in" the fighter-bombers to the target from a check point known to them and advised the strike aircraft of the effectiveness of their attacks and necessary aiming corrections for subsequent strikes.[38]

As was the case with the TACP's, the vehicle available to the Mosquito tactical air controller—in this case a T–6 trainer aircraft—together with its communications and target-marking equipment directly affected the effectiveness of the control procedure. With an airspeed of about 230 miles per hour, the T–6 could lead high performance aircraft on their first run over the target, but this aircraft lacked much that was desired in observer visibility of ground targets. It was not possible to operate a T–6 off the average division light aviation airstrip, although such would have been worthwhile for saving the time consumed inbound and outbound to the patrol area and for thorough briefing of the Mosquito crew on the ground situation prior to its patrols.[39] At the recommendation of the Joint Air-Ground Operations Board, the Fifth Air Force in April 1951 obtained several L–19's from Eighth Army with the idea that they would be able to operate from the division airstrips. Some 95 L–19 sorties were flown during July 1951, but the aircraft was rejected as a control plane probably because its low airspeed made it more vulnerable than

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the T–6.[40] Operating over the target area early in 1951 at altitudes varying between 35 and 2,500 feet, or 800 feet as a general average, the T–6 became increasingly more vulnerable as the Communists built up their automatic weapons.[41] Thus in October and November 1951 a build-up of automatic weapons on the I U.S. Corps front destroyed three Mosquitoes, necessitating a series of flak-suppression attacks before the hazard was alleviated.[42] In December 1951 the Fifth Air Force gave some thought to the substitution of F–51 aircraft for the T–6's, but the Mustangs would have required an impracticable radio retrofitting program.[43] By the last year of Korean hostilities 6,000 feet had been established as the minimum safe altitude for T–6 control and reconnaissance, but the Mosquito was permitted to descend lower for target marking and strike damage assessment.[44]

Initially, the Mosquito aircraft directed fighters to targets solely by radio voice contact, a time-consuming and very often inadequate method which was additionally complicated by the shortage of available communications channels.[45] In the autumn of 1950, following plans made by the Fifth Air Force office of operational engineering, FEAMCOM began installation of three rocket rails on T–6 aircraft to permit them to carry 2.25-inch subcaliber aircraft rockets (SCAR) modified with 2.36-inch white phosphorous bazooka heads for firing as target identification markers.[46] Fluorescent wing markings also assisted friendly fighters to locate the Mosquitoes, and belly tanks were installed to extend their range and endurance In July 1951 the last of the Mosquito planes was so modified, and early in August 1951 FEAMCOM also completed installation of both AN/ARC–3 and SCR–522 radios in the T–6 aircraft, permitting the Mosquito controller to utilize the same 12 channels used by a TACP. For direct communications with the front-line ground battalions, the Mosquitoes carried SCR–300 radios.[47] In January 1952 the first of a new complement of 50 LT–6G planes began arriving in Korea and these planes had replaced the tired old T–6C and T–6F models in the 6147th Group by May 1952. These replacement planes had many noticeable improvements: a self-contained fuel load, centralized radio controls, an improved rocket sight, an ability to carry 12 rockets, and improved visibility for pilot and observer.[48]

The Tactical Air Control System in Operation: The Fifth Air Force-Eighth Army tactical air control system exploited the exceptional circumstances of war in this peculiar Korean theater, but it generally conformed to the procedure outlined in the Joint Training Directive for Air-Ground Operations. For preplanned close support, divisions submitted requests to G–3 Air at corps, who in turn relayed the corps' request to the JOC. Normal requests for close support during the day went from division directly to JOC, with corps monitoring the transmission. Requests for emergency support originating with battalions were passed through regiment to division, which transmitted directly to the JOC, with the corps monitoring and having authority to disapprove the request if the target could be taken under artillery fire or if the strike were likely to endanger some other friendly ground unit. If the JOC approved the close-support request, an alerted flight was dispatched from a fighter-bomber airfield; en route to the target area, the close-support flight checked in with the TACC, with the division TACP, and contacted the Mosquito or the regimental TACP which controlled the strike against the target.[49]

Adherence to this practical procedure necessarily required some elapsed time between a battalion's request for close air support and the conduct of the air strike: from the beginning of Korean hostilities through February 1951 an Army operations research office report stated that the average time required to obtain a strike was 45 minutes for USAF aircraft.[50] On the basis of 2,380 close-support strikes flown in its area between 10 May and 5 June 1951, the U.S. X Corps reported that the average time interval between a battalion commander's request for a strike and the strike itself was 67 minutes, with a mini-

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mum time of 18 minutes and a maximum of 145 minutes having been observed.[51]

Recognizing that the timeliness of an air support strike was of great importance to a ground battalion commander, the Fifth Air Force made continuing efforts to reduce the time required between request and performance of a supporting strike. Fifth Air Force regulations required that JOC alert flights be airborne within 15 minutes after a scramble call, and the 49th Fighter-Bomber Group cut this time to 7 minutes by giving its pilots a general situation briefing, requiring them to standby near their aircraft for a flare-directed scramble, and by specifically briefing the flight leaders over the group-common channel while the aircraft were being armed.[52] Cognizant that some excess time was required for a strike to locate its assigned division, the Fifth Air Force gave the 6150th Tactical Control Squadron six BC–329 homing radios in July 1951, the idea being that these sets would be assigned to division TACP's, thus enabling close-support aircraft to locate these parties with a minimum of delay. Three of these sets were made operational in August 1951, but they were insufficiently mobile and their use was discontinued the following month.[53] The Fifth Air Force also discussed the desirability of providing the Mosquitoes with homing radio devices, permitting them to make rendezvous with fighter-bombers more rapidly, but such an installation never became available.[54]

While the request and ground-alert type close-support mission was most conservative of always scarce air power, the Fifth Air Force also made extensive use of air-alert close support. During the critical period of the initial Chinese Communist attack, Fifth Air Force frag operations orders to the tactical wings thus included a schedule of flights, the reporting times to the TACC, as well as the armament loads. While airborne over the TACC, the flight received an assignment to a division TACP for further briefing and assignment to an advance TACP or a Mosquito which controlled the close-support strike.[55] During the spring of 1951 when the Communists were attacking, flights of close-support aircraft reported to front-line Mosquitoes every 30 minutes.[56] Under this system, a steady flow of close-support strikes to the front was assured, but the burden upon the ground unit and the TACP became not to request air strikes but to try to find targets for those flights which were coming to them Targets could not always be found· between 1 November 1950 and 15 January 1951 lack of close-support targets necessitated the diversion of 437 aircraft from close support to armed reconnaissance, and during the same period 38 aircraft sent out for close support were obliged to return to base with their ordnance because they were unable to find targets.[57] Such a procedure was clearly correct in a time of ground emergency when time was short and communications were none too good, but it appears that the air-alerts were also practiced during battalion-sized ground actions: in June 1952 fighter squadrons of the 8th Group, designated daily in rotation for JOC alert, reported that they were still "sending off four ship flights at set intervals to work with the Mosquito controllers at the front lines." [58]

Night Close-Support with MSQ–1 and MPQ–2 Radar: While the Fifth Air Force did not choose to employ the TADC's of the 502d Tactical Control Group in day close-support control, it effected good use of them in management of the technique of night close support, called TADPOLE missions in Korea. The beginnings of an offensive night aircraft control system took place in January 1951, when the Fifth Air Force attached Detachments C, K, and N of the 3903d Radar Bomb Scoring Squadron to the 502d Group. These detachments, each operating an MPQ–2 radar, were sent to the field with the I, IX, and X Corps, the three detachments being connected in an SCR–399 communications net and controlled by the 6132d AC&W Squadron's TADC MICHAEL, located near Taegu. Assuming the role of tactical air direction posts (TADP's), these MPQ–2 detachments worked a few experimental night-bombing B–26's during the month.[59]

During February 1951 a series of tests established by the Fifth Air Force demonstrated

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that the TADP's were useful alike for controlling B–26's and B–29's in night close-support bombing, and the 502d Group's several TADC's occupied positions from which they could better maintain air warning coverage and funnel B–26 and B–29 night bombers to the MPQ–2 detachments. The TADC of the 607th Squadron moved from Taejon to Pyongtaek in February, the next month the TADC of the 606th Squadron took over at Taejon, while the 607th moved on to Yoju, where in early April it was emplacing its radar on a mountain site.[60] From this deployment the 502d Group controlled the highly effective MPQ–2 night close-support effort on B–29 and B–26 bombers against the Communist attacking forces during April and May 1951.* Aircraft were vectored to the TADP's by either MICHAEL TADC at Taegu or GREENHORN TADC at Pyongtaek Occupying positions just behind the front lines, the three MPQ–2 TADP's advanced and withdrew with the ebb and flow of battle, but despite numerous moves and maintenance difficulties they directed bombers against approximately 425 targets with some 450 drops during April. In May they directed 1,021 bomb drops against 956 targets in close vicinity to the UN front lines.[61]

After the MPQ–2 detachments had proved their value during the spring campaigns of 1951, the Fifth Air Force set about to improve their organizational status Personnel of the 502d Group was fed into the three detachments in August 1951, and the following month the replacements had become sufficiently skilled to permit the release of the men of the 3903d Radar Bomb Scoring Squadron for return to the United States.[62] At this time one of the TADP's was assigned to each of the 502d Group's AC&W squadrons. Once again, as the UN ground forces drove up to the 38th parallel, units of the 502d Group took over more favorable positions: on 2 June 1951 the 606th Squadron moved its TADC to a hill northeast of Kimpo airfield, the 608th Squadron (the 6132d AC&W Squadron was so designated on 2 November 1951) opened its TADC near Kangnung on 8 December 1951, and on 10 March 1952 the 607th Squadron moved its TADC from Yoju to Tokchung, a mountain north of Seoul.[63] The TADPOLES remained deployed across the Eighth Army front approximately 10 miles behind the front lines at sites permitting maximum efficiency for their line-of-sight narrow-beam radars. Thus by July 1952, HILLBILLY TADP (608th AC&W Squadron) lay behind I Corps; BEVERAGE TADP (606th AC&W Squadron) behind IX Corps; and CHESTNUT TADP (607th AC&W Squadron) behind X Corps.[64]

Simultaneously with these organizational changes and redeployments, the Fifth Air Force sought to improve the equipment levels of the TADPOLES. With the installation of APN–60 radar beacons in lead B–26 and B–29 aircraft in May 1951, the MPQ–2 control range was theoretically extended from 30 to 110 miles, but terrain shielding held the maximum range effectiveness of the combined equipment to about 65 miles.[65] The beacon permitted the TADPOLE to control a formation of planes, but it was actually little used since shoran was more accurate for bombing at any distance and there were seldom any targets warranting a formation bombing near the front lines. Two new MSQ–1 radar bomb-directing sets were received in October 1951, but some period of time was required before these new sets could be sufficiently shaken down to replace the old MPQ–2 sets. One of the first test missions of a MSQ–1 set near Kimpo resulted in an operator's error in which the radar installation was itself bombed, fortunately the B–29 carried incendiaries which burned seven or eight tents but caused no loss of personnel.[66] Arrival in November 1951 of officer personnel familiar with the MSQ–1 assisted the project, and by May 1952 two MSQ–1 radars were in operation at HILLBILLY and BEVERAGE.[67] While the MSQ–1 had a longer theoretical range than the older set, the mountainous terrain of Korea canceled this advantage; accuracy of the MSQ–1, however, was somewhat better and its computer was more refined and faster than that of the MPQ–2.[68]

**See* Chap. II, pp 65–66

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Whether the equipment used was the MPQ–2 or the MSQ–1, the tactical employment was the same. The radar installations were surveyed in using bench markers located to second order survey accuracy (1:10,000). After the sets were in location, target selection was undertaken by the particular corps to which they were assigned. Target recommendations also came to corps from its divisions, the recommendations being based upon information from prisoners, observation posts, artillery air observers, fighter pilots, and from the mission reports of the 45th Tactical Reconnaissance Squadron.[69] Most TADPOLE targets were area objectives, and the corps G–3 Air specified two pairs of coordinates on the 1:25,000 scale map to be used in determining the beginning and end of the target area. Requests for missions by target coordinates went from corps to JOC for approval, and if favorable action was authorized they were passed through the TACC to the TADP. After this transmission, the TADP's usually checked the target coordinates directly with the corps to insure that they had not been garbled.[70]

As soon as he had received the target coordinates, the TADPOLE controller made the necessary parallax computations for both pairs of coordinates, a process which consumed several man-hours since the TADP normally handled several targets each night. When the TADC had vectored an aircraft to the TADP, the TADPOLE controller made contact with the pilot and located the aircraft on his radar scope; from the pilot he received data covering altitude and number of types of bombs, and from this information, together with a radar check on the ground speed of the aircraft, the controller computed intervalometer settings necessary for the target and worked out the bombing problem. Usually, B–26's bombed with TADPOLE from 12,000 to 14,000 feet, and B–29's came in higher at 16,000 to 18,000 feet. If the bomb load was not suitable for the target, the TADP contacted the JOC for clearance to bomb a more suitable objective; under no circumstances could parafrags or butterfly bombs be used against targets near the front lines. All the while such information was being passed, the aircraft was being positioned on course by the TADP, the controller bringing the pilot to a predetermined initial point, where an order was given to open bomb-bay doors. As the aircraft neared the proper release point, the controller gave the pilot a count down and at zero bombs were released. The pilot was subsequently informed when he was over the ground target in order that he might check his results visually by fire or smoke. In June 1952 the controller-pilot combination, when working at top speed, was able to complete such a mission from initial contact to bombs-away in an average of 11.5 minutes.[71]

This same TADPOLE procedure was useful for directing night photography; it was also used on one experiment in October 1951 when small formations of C–119's dropped napalm along the battle lines [72] * In June 1952 flights of four Mustang fighters, guided by TADPOLES against weather-shrouded daytime targets, did some straight and level salvo bombing from 12,000 to 16,000 feet.[73] Improving with experience, the TADPOLES successfully established a new peak for night operations in July 1952 when 1,221 bomb-runs were controlled and 2,388 tons of bombs were dropped in support of front-line UN ground troops.[74]

Most TADPOLE targets were immediately beyond UN front lines, the range of most drops from an electronics site being 25,000 to 50,000 yards.[75] Because of the proximity of such targets to friendly ground positions, considerable attention had to be given to bombing accuracy, including the determination of normal CEP's with the TADPOLE technique. After a study of combat MPQ–2 night bombing during May and June 1951, an Army team determined that the system had a standard deviation in range and deflection of 580 feet and 490 feet for B–26's and of 810 feet and 560 feet for B–29 aircraft. Although the conclusions of this study were open to question (31 per cent of the bombs on which the calculations were based were classified as missing), the Army team stated that the safety limit of MPQ–2 bombing should not be less than 1,000 feet, in which case 97 5 per cent of bombs could

**See* pp. 216–17.

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be expected to fall into enemy territory.[76] A Fifth Air Force operations analysis study made in May and June 1952 generally confirmed this recommended safety limit when it was determined that the MSQ-1 and MPQ-2 system had a circular error probability of 1,177 feet.[77] This figure appeared reasonable considering the experience level of the operators, the condition of the equipment, and the current method of controlling the aircraft and directing bombs-away by voice, but it was considered to be a considerably greater error than would result with up-to-date equipment and well trained personnel.[78]

From the beginning of the employment of the technique, TADPOLE night-bombing met the especial favor of ground commanders During the Communist spring offensive of April 1951, the U S I Corps reported that the night-bombing system "worked very effectively and with surprising smoothness during the entire action" [79] Lt. Gen. E. M. Almond, commanding the U.S X Corps during these spring offensives, stated that: "Radar controlled bombardment in close support of ground troops is distinctly effective." During the period 16–23 May, the X Corps was supported nightly by B–29 and B–26 bombers controlled by MPQ–2 radar, the number of planes varying from 2 B–29's and 8 B–26's on the night of 16/17 May to a total of 22 B–29's on the night of 22/23 May, the targets selected being enemy reserves and enemy units assembling for night attacks. Most of the evidence of the successful effort of the night-bombing against targets in support of X Corps was negative. enemy troops did not launch expected attacks out of areas bombed by radar-directed bombers and made no major night attacks at all after 20 May. One captured enlisted man who escaped during the confusion of the bombing reported that on the night of 20 May bombers had caught a CCF battalion assembling for an attack; the bombing had caused terrific explosions, had inflicted many enemy casualties, and had caused the surviving troops to retreat northward in disorder. A 9th Infantry patrol into the area shortly after the bombing encountered no opposition and counted an estimated 200 to 300 fully-armed CCF dead as a result of air attack "The combat experiences," stated General Almond, "indicate that serious consideration should be given to the employment of medium bombers against tactical targets whenever such aircraft is available" [80] Once they had had a taste of it, ground commanders apparently had difficulty getting enough of radar-directed night bombing support.

EXPRESSIONS OF GROUND DISSATISFACTION WITH CLOSE SUPPORT

Background to the Problem: "At the present time," wrote Brig. Gen. Gerald J. Higgins, representing the Army Field Forces on an inspection trip to Korea, on 1 December 1950, "coordination and cooperation between Fifth Air Force and the Eighth Army is excellent at all levels. . . . Newspaper reports and personal letters to the contrary, I found only one unit commander whose remarks were derogatory insofar as air support is NOW concerned." [81] This statement and the record of the strong air support extended by Fifth Air Force to Eighth Army marked the major theme of the Korean campaign; there were nevertheless some ground officers who were not content with the manner in which supporting air was controlled.

During World War II no system of providing close air support had been common to all of the various theaters of war, and in Korea, where officers and men of various wartime experience were gathered together, it is not strange that misconceptions of extant doctrine should have caused misunderstandings The approved USAF-Army doctrine on close air support had originated with the fighting in North Africa, and the techniques used there had been elaborated in Italy and had also been utilized as the foundation for somewhat changed techniques which were used in the battles of Europe, the most extensive ground-

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air fighting of World War II. In the Pacific theaters of World War II still other techniques had been developed: one system was common to the Southwest Pacific Theater, while another had been worked out to provide the especially heavy close air support demanded in the amphibious invasion of island objectives in the South and Central Pacific.* At the end of World War II officers of the Army and of the Army Air Forces had prepared a doctrinal manual for common usage representing the best that had been learned in that conflict· this manual was Field Manual 31–35, *Air-Ground Operations*, published in August 1946 This manual had been elaborated in detail by the Joint Training Directive for Air-Ground Operations, prepared jointly by the Army Field Forces and Tactical Air Command and issued on 1 September 1950 These documents represented the best of learning regarding the cooperation of air and ground forces in a land campaign.

The doctrine and organization for the close support practiced in the U.S. Navy and Marine Corps had originated in the South and Central Pacific during World War II. Here the fighting had been marked by a series of short but intensive amphibious attacks against enemy resistance which had to be subdued in a matter of days or weeks. Since the Marine infantry forces put ashore by small amphibious craft were lightly gunned, Marine aviation was lavishly provided to make up the deficiency in artillery. At the close of World War II, Marine air and ground forces had been organized to support an amphibious mission. each Marine division could normally expect the support of a Marine air wing, the latter being in effect a small tactical air force with its own ground control intercept and tactical air control squadrons as well as combat aviation. Each Marine battalion was accompanied by a forward air observer, who in a matter of minutes could call down supporting aircraft from a flight normally kept orbiting over the battle area by the Marine air wing. Since Navy high-performance aircraft normally maintained air superiority in an objective area, the Marine aircraft practiced air support of ground troops as their primary mission.

One of the fundamental philosophical differences between the USAF and Marine systems for close support was the degree of reliance placed by Army and Marine ground forces upon the supporting fires of their own artillery. Army commanders prefer to rely on their own artillery within the first 1,000 yards of the front, realizing that against area targets half a basic load of artillery-mortar fire for a division is equivalent to 900 air sorties with 500-pound bombs. Maj. Gen. Hobart R Gay, commander of the 1st Cavalry Division in North Korea, stated that air support was worth ten times as much beyond the first 1,000 yards as within it. The Army nevertheless desired that air possess the capability to apply close support within 1,000 yards of friendly positions when critical situations demanded it. On the other hand, Marine ground commanders could normally expect only the flat-trajectory fire of naval guns, not particularly effective against ground installations or defenses of the enemy, and they insisted on using close air support in the first 1,000 yards ahead of their lines. Since the Marines utilized air support as a substitute for artillery, it was necessary that they send forward air observers with each of their battalions; to assure an air strike within 5 to 10 minutes against enemy targets in such close proximity to their front lines, they had to have aircraft on station overhead virtually all the time. The Army, on the other hand, preferred to utilize air against targets which could not be attacked by its artillery, either because the enemy objective was outside the artillery range or in some closer defilade which could not be attacked by howitzer or mortar. These targets, even if they were moving, could not be expected to reach friendly positions for a period of time and were often too far distant for the visual observation of a ground observer. The Army air support philosophy did not necessitate immediate close support; in a normal situation there would be adequate time to employ the call-type air support missions which were much more con-

*See AHS–73, Development and Application of Tactical Air Doctrine, 1917–1945, and AHS–86, Close Air Support Operations in the War Against Japan

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servative of always scarce air power than were air alert missions. There was utility in a tactical air coordinator who could locate and call air strikes upon close-support targets outside the visual range of a forward air controller on the ground.[82]

The Marine system of close support was designed to meet a specialized type of intensive ground fighting quite dissimilar from a campaign on an army or army-group front; however, the peculiar war in Korea was such that it exaggerated the positive advantages of the Marine system and minimized its disadvantages. The 1st Marine Air Wing operated virtually independently in support of the 1st Provisional Marine Brigade during the period of 3 August through 14 September 1950 in the Pusan Perimeter; it supported the U.S. X Corps in the amphibious invasion of Inchon and the subsequent capture of Seoul in the period 15 September through 4 October 1950, and it again supported the U.S X Corps on the eastern coast of Korea between 20 October and 24 December 1950. In each of these operations, fighter squadrons of the 1st Marine Air Wing were able to base on escort carriers or airfields quite close to the ground fighting, had the Communists possessed an air attack potential they would have prevented the small escort carriers from operating with such freedom Hostile jet fighter opposition would also have played havoc with the conventional F4U Corsairs, which the Marine airmen used to orbit for long periods of time over the battle area before they were called in for air support strikes.*

Performance records of the 1st Marine Air Wing and the Fifth Air Force led ground commanders, who did not perceive the unusual nature of the Korean fighting, to believe that the Marine system was superior. Thus an Army study dated 1 February 1951 stated that the average time required to obtain a close-support strike was 45 minutes from the Fifth Air Force and 5 to 10 minutes from the Marine air unit. More than 95 per cent of Air Force strikes were air controlled; more than 90 per cent of Marines strikes were ground controlled. The average distance from an air support target to friendly troops was 0.9 mile for the Marines and 3 to 4 miles for the Air Force. Fifth Air Force close support of U S. Army divisions averaged 12 sorties per division per day, while the 1st Marine Division received an average of 37 sorties per day.[83] With a demurrer as to the accuracy of these very exact figures drawn from a somewhat confused period of fighting, it is nevertheless possible to observe that they were not inconsistent with the divergent Army and Marine philosophies of air support The Army was supposed to have sufficient artillery to provide the bulk of its supporting firepower, while the Marines had always depended on aircraft to provide an important part of their fire support.

But at no time from the initiation of Korean hostilities through the Chinese Communist offensives did the Eighth Army have what it considered to be an adequate amount of artillery. Prior to Korea appropriation limitations had forced reductions in Eighth Army division-artillery, tank, and automatic-weapons strength. No army or corps field artillery support was present in the Far East theater. During the summer and autumn of 1950 ground division commanders freely admitted that they utilized air support as just another form of artillery because they lacked field guns and ammunition.* In April 1953 General Van Fleet testified before a U.S Senate investigating committee inquiring into ammunition shortages in Korea: "In Korea," he said, "we have only 25 per cent, approximately 25 per cent or less, the number of guns we had per division in France" At this time General Almond concurred with the Van Fleet statement, adding that: "Our ammunition supply was greatly augmented by bringing in air bombers of all categories . within very short distances of the front line." [84]

The Question of Attaching Air Units to Ground Armies: In view of the close association of the Marine air wing with the U.S. X Corps it is not surprising that most of the expressions of dissatisfaction with the extant Army-Air Force cooperation system should

*See pp 213–19

*See AHS–71, p 30

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have come from the X Corps. Most of the X Corps observations concerning the "inadequacy" of extant doctrine failed to take into effect the fact that the U.S. Eighth Army and Fifth Air Force enjoyed fairly normal and harmonious relations.

On 25 December 1950, General Almond forwarded to the Department of Army a staff study prepared in his capacity as FEC chief of staff and X Corps commanding general. While he discussed the necessity for the development of an especially designed aircraft for close air support and the requirement for continuous air-ground training of tactical air units, General Almond's major conclusion was that: "Field army or separate corps commanders should have operational control over supporting tactical air units." To this end he believed that tactical air units should be organized and employed on a minimum basis of at least 1 squadron (24 aircraft) to each infantry division or 1 group per corps of 3 divisions, with additional squadrons being allocated to each field army. A preferable apportionment of air to ground forces would be one group of tactical air per infantry division. To effect control of tactical close support, Almond stated that one TACP must be made organic to the infantry battalion and each higher ground echelon: "Then, and only then, can the commander most concerned—the Infantry Battalion Commander—be assured of realizing full support of all weapons needed to accomplish missions assigned." [85]

These recommendations of the commanding general of the X Corps in part coincided with those of Gen. J. Lawton Collins, chief of staff U.S. Army, who on 21 November 1950 had recommended a minimum allocation of one fighter-bomber group per army division overseas and one reconnaissance group per field army, this minimum to be increased to two reconnaissance groups on full mobilization. The army commander, down to include corps level in some instances, should exercise operational control of close air support units engaged in providing reconnaissance and fire support to the ground operation. In a restatement of 21 March 1951 General Collins recognized that when an enemy having a great superiority of air power was engaged centralized control of tactical air units under a senior Air Force commander might be necessary, but that once air units were allocated to the support of an army or independent corps the ground commander should have operational control of the supporting air.[86]

The Almond study was subjected to extensive comments by Generals Partridge and Weyland, who found it to be based on two doubtful assumptions: that the Korean war, with no all-out enemy air opposition, constituted a valid test of extant air-ground doctrines, and that army requirements for tactical air had no concern with financial or budgetary limitations. Regarding the numerical allocation of air groups to ground divisions, General Weyland pointed out that the Fifth Air Force was providing 9 groups and the FEAF Bomber Command 3 groups in support of the Eighth Army's 6 ground divisions, and in addition FEAF was furnishing lavish air cargo support. General Partridge thought that the size of the tactical air arm was dependent upon many factors, the chief of which was the nature of enemy air opposition. Only by centralized control of air power could aircraft be moved to any sector of the front in the quantities required to meet a specific threat Army commanders, moreover, were primarily concerned with the enemy immediately in front of their troops: the only support that they appreciated was that which they saw directly on their front. "The destruction of a dozen tanks prior to their entry into the combat area," Partridge wrote, "does not concern the Army Commander so much as the destruction of one tank directly in front of him . . , and it is for this reason that operational control of the air arm should not be delegated to the Army Commander." The better the air force could perform the other phases of its tactical mission—air superiority and interdiction—the less effort would be required in direct support of front-line troops.[87]

Discussions Regarding Tactical Air Control Parties: The problem of allocating tactical air control parties to ground units concerned the smallest unit of the tactical air control system

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but it also involved the very philosophy of air employment. When General Almond had led the X Corps ashore at Inchon he had insisted that FEAF provide his U.S. 7th Infantry Division with a total of 9 TACP's instead of the normally provided 4 per division. Providing a TACP for each infantry battalion, as Almond recommended in his study of 25 December 1950, would require the allocation of 13 TACP's to each infantry division. When the Fifth Air Force professed an inability to provide such a number of parties, General Almond in January 1951 organized from his own resources provisional TACP's, each consisting of 1 officer, 1 radio operator, an SCR-300 radio, and a jeep. These parties, one of which was formed by each infantry battalion, were tested with an L-5 plane equipped with SCR-300 radio, and General Almond said that they "worked perfectly from the standpoint of communication." [88]

As far as Korea was concerned the matter of allocating 13 TACP's to each infantry division was actually academic. The Eighth Army also wished to see the allocation of a TACP to each infantry battalion, but a special investigation of the Joint Air-Ground Operations Board in March 1951 demonstrated that it would be technically impossible to employ such a number of TACP's in Korea: the board estimated that it would require approximately 100 separate VHF control channels to employ TACP's at battalion-level and to insure that VHF communications would not be overloaded to a point where control of strike aircraft was impossible. It was agreed that the lack of available radio channels in both ground and airborne radio equipment had already hindered the maximum exploitation of close air support and that the addition of any more ground controlling facilities would in all possibility saturate the system to such an extent as to cause a complete breakdown of the air-ground support system.[89]

General Weyland had already directed attention to the impossible communications tangle which would result if each infantry battalion was accompanied by a TACP,[90] and in reply to General Almond's study Weyland noted that approved air-ground doctrine contemplated that TACP's would be provided on a flexible basis where most needed. While the Marines, manned for amphibious operations, were authorized a TACP for each infantry battalion, Weyland saw no reason why the complicated conditions of amphibious landings by relatively small forces should be used as an operational basis for massive land armies and air forces. General Partridge perceived the underlying significance of the matter: [91]

> The issue is not the allocation of TACP's to Battalion level but the delegation of control of air support to the Battalion Commander. It appears that the X Corps desires control of close support delegated to the Battalion level whereas the Fifth Air Force feels that the control should be maintained at the Fifth Air Force-Eighth Army level. The inherent flexibility of the air arm can be best utilized when control is exercised at the highest level Such control permits the massing of air power over a given point in the minimum amount of time Only through centralized control can maximum utilization of available forces be obtained. This principle was proved during World War II and has been recognized by both the Chief, Army Field Forces and Commanding General, Tactical Air Command as set forth in Joint Training Directive on Air-Ground Operations, dated 1 September 1950. As for the assignment of TACP's as an integral part of the Army infantry unit, the Fifth Air Force does not concur The TACP is just one of the many facilities available to the air commander to assist in placing bombs and other armament on the target. The Air Commander is responsible for destruction or neutralization of a given enemy target whether it be a bridge or enemy troops opposing friendly forces Therefore, he must have command of all elements that are to be utilized in delivering the attack

No small part of the ground force preoccupation for a TACP with every infantry battalion had evidently grown out of early Korean experience when TACP's were employed not only as directors of aircraft but as a means to contact passing aircraft to divert them to emergency close support targets; then the TACP communications, relayed through Mosquitoes to the JOC, had become the accepted form of air request. Army commanders had therefore come to believe that they had to have a TACP to get air support and that additional TACP's would mean additional air support. These

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ideas were finally forged into the concept that the Army required control of supporting air and their own integral TACP's.[92]

Certainly an analysis of tactical air experience in World War II showed that the Army demand for one TACP per infantry battalion was excessive During the extensive fighting of this general war, the TACP function, variously known as the tactical air party officer, the air-ground control officer, or simply as the forward controller, had been developed as the media through which air strikes could be brought into close proximity to ground troops. From first employment in North Africa, the concept had been that a TACP was justified only when the tactical situation indicated a profitable employment of aircraft in support of ground action and only when definite ground operations were contemplated or already in progress. In the Italian campaign during the Salerno operation, one forward controller operated where needed on the entire Fifth Army front. In May 1944 two controllers were designated for Fifth Army in view of its operations, one assigned to the Anzio sector and one covering the main effort south of the Liri River. Allocation and employment of tactical air controllers in the European Theater of Operations was based upon the experience in North Africa and Italy but in order to accommodate an accelerated ground campaign, the number of TACP's was increased to allow one per corps and one per division. Only in the Third Army where the armored divisions customarily advanced in two or three columns, each column comprising a combat command comparable in size to a regiment, were TACP's assigned below division level. In addition to controlling air strikes, the TACP officer acted as air liaison officer and advisor to the ground commander of the unit to which he was attached, and except in the case of controllers with armored divisions, the TACP usually was found at the division command post. At this central location the TACP could readily ascertain the position of front line troops and use ground wire communications to artillery and front line units At the division command post, the TACP was seldom able to control air strikes visually; the controller therefore customarily received descriptions of the target from front-line observation posts and utilized supporting artillery to mark the air target with smoke. This positive artillery smoke shell identification was also frequently used to provide a reference point to airborne pilots when the controller was within visual range of the target. Statements from generals commanding ground units during World War II found no deficiency in such an allocation and employment of forward controllers; moreover, the system proved adequate to manage a close-support effort which varied from 10 to 15 per cent of the entire air effort and consumed some 36 per cent of all fighter-bomber sorties.[93]

General Partridge's perception that the underlying significance of the TACP matter lay in a desire for the delegation of the control of air support to the infantry battalion commander was shrewd, for General Almond directly advocated this on 15 July 1951. Stating that the average time in which a battalion commander received a requested air strike was 67 minutes, General Almond further observed that the time consumed between the origination of a battalion request and the JOC receipt of the request averaged 6.5 minutes but in some cases required 30 minutes. The amount of time used in sending a battalion request to the JOC being too great, Almond recommended that a battalion commander should be permitted to request air support directly from a TADC at corps, with regimental and division commanders monitoring the request net. This method would eliminate the time lag when regimental, division, corps, and army passed on the validity of a battalion commander's request. General Almond further recommended that a corps commander should have operational control over a fighter-bomber force equivalent to one group per division On the staff of each corps commander would be an Air Force (Almond said "Air Corps") officer who would be similar in stature and responsibility to the corps artillery officer, and would have two jobs, one as an air staff officer and the other as commander of the attached fighter-bomber groups. The tactical air force supporting the field army would

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provide administrative support for these groups.* [94]

While the Air Force remained adamantly opposed to the integration of TACP's into infantry battalions, it did permit remedial action needed to improve the operation of the parties In Korea the Fifth Air Force's problem of maintaining TACP vehicles and signal equipment at a distance from other air units was difficult; traveling maintenance teams visited parties at the front as often as they were able and where possible each TACP was accompanied in the field by a back-up or spare radio jeep. Early in 1952 a team representing the U S. Joint Tactical Air Support Board visited Korea and concluded that simplified maintenance of TACP signal equipment and vehicles would result if the Army furnished all equipment and enlisted technicians and the Air Force provided the forward air controller.[95] While it was agreeable to the fullest cross-servicing of equipment, the Fifth Air Force forwarded an "unqualified recommendation . . . that the responsibility for manning, equipping, and maintaining of TACP's remain with the USAF." † [96]

Quantitative Allocation of Close Support Sorties: During periods of active UN ground campaigns the Fifth Air Force provided generous amounts of close support. As of February 1951 an Army study computed that air support per division had averaged out as 12 sorties per day, an amount which it considered to be an adequate standard for planning purposes. As may be seen in figure 16, the Fifth Air Force provided far more than 12 close-support sorties per division per day during periods of extreme emergency. This over-all average of 12 daily close-support sorties per division, however, compared most favorably with the World War II experience in Europe where U.S. divisions averaged 5 to 10 close-support sorties per division per day, depending on the particular army.[97] With the beginning of reduced ground operations during the Kaesong peace talks, the Fifth Air Force initiated a comprehensive interdiction campaign designed to curtail the logistics build-up of Communist front-line positions

Believing in the soundness of the FEAF interdiction effort, General Van Fleet agreed to limit close-support sorties across the Eighth Army front to 96 per day, a number which averaged approximately 8 sorties per division. Should an emergency arise such as a major enemy offensive, a major UN offensive, or should other profitable close-support targets appear at any time, the Fifth Air Force would provide maximum close support.[98] General Everest felt that this was a sound division of effort under the existing circumstances.[99] So long as a ground stalemate continued, there was little justification for heavier close-support effort, but the Fifth Air Force thought it advisable to fly a minimum of close-support sorties in order to maintain the proficiency of its pilots and the close-support control system.[100] Aircraft of the 1st Marine Air Wing, moreover, were committed almost entirely to close-support effort As may be seen by reference to figure 16, Fifth Air Force close-support sorties were reduced in quantity during the ground stalemate in Korea

The Communists were shrewd enough to recognize the essential weakness in the Van Fleet-Everest agreement showing in their actions that they recognized that they could, by intensifying localized ground fighting, divert sorties from interdiction to close air support When interdiction was hurting them, the Communists therefore launched bitter attacks against positions along the Eighth Army defense line.[101] Some Eighth Army troop units, moreover, evidently did not favor the reduction in close support, despite the efforts of Fifth Air Force to get the latest air intelligence reports regarding interdiction successes to its liaison officers so that they could brief ground

*General Almond thus proposed to turn the clock back and adopt exactly the same system which was utilized by the Army Air Forces and Army in the early days of World War II and which had completely failed during the spring campaign of 1943 in North Africa (*See* AHS-24, Command of Observation Aviation A Study in Control of Tactical Air Power)

†Such a delineation of responsibilities was nevertheless acceptable to the Chiefs of Staff, U S Army and USAF, who on 2 July 1953 notified subordinates of a realignment as follows the U S Army would furnish, maintain, and command the equipment and personnel (less forward air controllers) of TACP's, the communications equipment to be compatible with that used in aircraft USAF would provide a FAC, direct aircraft through the FAC, and allocate radio frequencies Effective date for the realignment was set at 1 Jan 1954 (Msg DA-942830, DEPTAR to CINCEUR and CINCFE, 2 July 1953)

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AVERAGE NUMBER FEAF TACTICAL SORTIES DAILY

(USAF Aircraft Only)

June 1951–June 1952

	June	July	Aug	Sept	Oct	Nov.	Dec	Jan	Feb	Mar	Apr	May	June
Total tactical sorties	10,666	8,026	8,532	11,110	12,738	10,991	10,940	9,650	9,172	11,569	10,869	14,308	10,396
Daily average	355	259	275	370	411	367	353	311	316	373	362	462	347
Daily average close support	68	35	26	29	32	38	10	13	6	35	23	33	64
Per cent of total	19	14	10	8	8	10	3	4	2	9	6	7	18
Daily average interdiction*	126	127	127	232	284	284	263	216	212	205	208	260	181
Per cent of total	36	49	46	63	69	77	75	70	67	55	57	56	52
Daily average armed recon.	108	65	85	55	31	7	6	3	8	23	2	3	6
Per cent of total	30	25	31	15	7	2	2	1	3	6	1	1	2
Daily average escort	18	14	3	5	11	10	5	7	1	5	14	20	11
Per cent of total	5	5	1	1	3	3	1	2	0 5	1	4	4	3
Daily average counter-air	35	18	34	49	53	28	69	72	89	105	115	146	85
Per cent of total	10	7	12	13	13	8	19	23	28	29	32	32	25

* Interdiction includes only strikes against pre-briefed targets
Source USAF Directorate of Statistical Services, FEAF Summary, 31 Aug 1952, p 7.

Figure 16

staffs. The Fifth Air Force also held a special briefing each week for such Eighth Army command and staff officers as could attend.[102]

Ground forces opposition to the curtailment of close air support came to a head in the 1st Marine Division When this division had gone into the Eighth Army battle line, the 1st Marine Air Wing had also pooled its air effort under the coordination control of the Fifth Air Force. The 1st Marine Division therefore requested close air support in the same manner as did other Eighth Army divisions; whenever possible, however, the Fifth Air Force attempted to see that ground Marines were supported by Marine aircraft. Under the USAF-Army system of close air support a longer period of time was required by a Marine battalion in getting its close air support than was the custom with the Marine system of air alerts; the Marine division, moreover, had a cut-back in the quantity of its close air support sorties in common with other Eighth Army divisions.[103] Dissatisfied with the amount of close support being furnished his division and desiring to be supported exclusively by the 1st Marine Air Wing, Maj. Gen Gerald C. Thomas, commander of the 1st Marine Division, brought a complaint to General Everest on 2 October 1951. General Thomas was convinced that he had taken unnecessary troop casualties because of inadequate air support, and as a practical rule of thumb he stated that the Marine division required 40 Marine air support sorties per day.[104]

In his reply General Everest explained that the distribution of close air support from all sources to Eighth Army during September 1951 was: I Corps, 335 sorties; IX Corps, 356 sorties; X Corps, 1,664 sorties; and I ROK Corps, 96 sorties. And of the 1,664 sorties flown for X Corps, the 1st Marine Division had received 679. The JOC, moreover, commonly utilized the 1st Marine Air Wing on strip alert for close support and made efforts always to commit Marine aircraft to the support of the Marine division; such was not always possible, but during September 68 per cent of the 1st Marine Division's close support was by the Marine air wing, the remainder being flown by Fifth Air Force or Navy planes. General Everest could not agree to discriminate in favor of the 1st Marine Division by giving it 40 close-support sorties a day when the entire Eighth Army front was to receive only 96.[105]

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General Van Fleet agreed that the current allocation of close-support effort was sound and sufficient within the means available to Fifth Air Force, and General Ridgway, while sympathizing with the Marine ground's desire to be supported by Marine air, could not agree that any one division in the battle line should receive a disproportionate close air support at the expense of all other divisions.[106]

According to doctrine, close air support is made available by the USAF against targets which ground troops cannot neutralize with their own organic fire; the setting of even a planning standard in Korea indicating that a division should receive a given number of close air support sorties daily inevitably led ground commanders to consider that the given number of sorties belonged to them. A few ground units evidently determined to obtain their air support sorties whether or not they had suitable targets for them. In some part this attitude was due to an observation that enemy troops took cover when UN aircraft were about: in July 1951 a Navy operations analyst reported that close air support had "the indirect effect of limiting casualties by keeping the enemy down or discouraging him from firing. . . ." [107] Following the notable success with the radar-directed night B–29 attacks in April and May 1951, it was reported that "all ground units now expect at least a part of one aircraft load in their sector every night regardless of the degree of contact with the enemy." [108] In November 1951 air liaison officers twice complained of ground force handling of close support: the first report stated that a division commander had instructed his G–3 air "to request 15 prebriefed flights per day and to *find* targets to justify this many flights"; the second pointed out that another divisional G–3 air, for want of better targets, was using large numbers of strikes against small bunkers containing at most 2 to 5 men.[109]

Eighth Army Discontent with the Close-Support System: Throughout 1950 and most of 1951 the tocsin of discontent with the extant USAF-Army doctrine had been most pernicious in the U.S. X Corps. Eighth Army headquarters had sought always to find solutions for the peculiar Korean problems within the framework of extant doctrine. Before his death, General Walker had stated: [110]

> You hear and read much about the type of support furnished by the Marine air units. It's good, it's excellent, and I would like to have that kind of air support available too—but if the people who advocate that would sit down and figure out the cost of supplying air units for close-support only, in that ratio to an army of the size we should have, they would be astounded. Why, even if our economy were many times as strong as it actually is, we couldn't support such a program

The Eighth Army-Fifth Air Force Joint Air-Ground Operations Board in March 1951 had also gone on record with the opinion that extant doctrine was "sound and adequate." [111] From the beginning of operations, the Fifth Air Force commander and the Eighth Army commanding general had shared a mutual concern and interest in interdiction, close air support, and air attacks against targets of opportunity. Neither commander had had lavish resources at his disposal to overwhelm tactical opportunities when they were presented, but the Air and Army commanders had collaborated intimately, resolving any differences in their necessities and sharing common plans for action Air effort had always been employed to obtain and exploit the maximum tactical advantage for the accomplishment of common mission. The Eighth Army commander had concurred with the daily planning allocation of air effort available for close support But at echelons lower than the Eighth Army a growing infection of discontent led to insistence upon receiving arbitrarily equal shares of close air support sorties, thus swelling the requirements for close support Disregarding the mobility of air power, corps and division commanders wanted air support in order to swell or to supplement their rationed artillery fire.

By December 1951 the "continuing demands of the subordinate echelons in the Eighth Army" had built up against General Van Fleet, who, in his own words, had always "played ball" with the Fifth Air Force and was appreciative of the all-out support it had given him whenever he requested extra effort in sup-

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port of a push. It is quite likely that the pressure upon General Van Fleet was both from the top level of Army command as well as the lower echelons of Eighth Army. On 17 December 1951 General Van Fleet visited General Everest to discuss his problem: He began by describing the corps organization of the army as the basic fighting unit The corps commander had a great deal of latitude in employing his forces as long as he stayed within the army plan; he controlled his artillery, engineers, communications, and everything else within his area of responsibility. The only thing which the corps commander could not control was the allocation of his air support Van Fleet therefore proposed that some air—how much he was not exactly sure, but in the order of one squadron of fighter-bomber aircraft—be assigned to each corps. Such a change would not be made immediately, but possibly in the spring of 1952 if the fighting broke out again. In order to be as effective as possible, this squadron would be located on an airfield as far advanced as the vicinity of the corps headquarters. Such an assignment would eliminate what Van Fleet referred to as the "continual competition between divisions and corps for close support." Each corps commander would have so much air to use according to his own plan, and all that Van Fleet and Everest would have to do was to watch and monitor this use.

General Everest immediately pointed out the inflexibility of such a system and asked how Van Fleet meant to meet a situation in which one corps needed a large amount of air support. Van Fleet replied that the senior air commander or the army commander would shift the effort from corps to corps, but normally on a day-to-day basis, thus assuring that the corps commander could still have his own squadron available. When Everest pointed out that three squadrons along the Eighth Army front would provide less sorties than the Eighth Army had been furnished on an average in the prior six months, General Van Fleet replied that the reduction in effort would be more than made up for by the satisfaction of the corps commanders in having something they could count on and run themselves. When Van Fleet had completed talking, General Everest told him frankly that he did not believe in the soundness of putting air units under the operational control of corps commanders and that he had no personal authority to depart from established principles of air employment. He suggested, as the friendly conversation broke up, that the battleground for such an interservice argument was in Washington, not in Korea.[112]

General Everest thought that the normally enthusiastic and direct Van Fleet had not had his heart in the proposition which he had advanced in their conversation, but three days later on 20 December 1951 General Van Fleet forwarded his proposal to CINCFE by official letter. He now proposed to utilize Korea as a testing ground to determine whether the organization and command for the joint employment of air-ground forces was sound. "While the close air support in Korea has been highly successful," he wrote, "it is capable of much further development and improvement." The deficiencies of the air support system, as Van Fleet saw them, were attributable to several factors: 1) an insufficient number of sorties available for close support; 2) an insufficient number of airfields located laterally across Korea immediately behind the main line of resistance; 3) the retention of central control of aircraft by the JOC, which imposed administrative delays that reflected unnecessarily in the elapsed time between the request and delivery of air support, 4) the excessive amount of time required to place an aircraft on the target after arrival in the target area; 5) an insufficient number of TACP's and a doubtful reliance upon Mosquito control; 6) initial inexperience and the relatively short tour of duty of TACP's; 7) the USAF failure since World War II to develop special aircraft and armament capable of providing more effective close support to ground forces. General Van Fleet had not mentioned any of these specific complaints in his conversation three days earlier with General Everest.

After such an introduction, General Van Fleet approached the heart of the matter: he thought that the advantages of decentralizing

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control of an army front to the component corps had been well demonstrated, and with the advent of atomic warfare this decentralization would probably be accelerated In order to decentralize tactical air to corps commanders' control, Van Fleet proposed to take three squadrons of Marine aircraft under the Eighth Army's operational control which he would further decentralize by placing one squadron under each of his three corps commanders. These squadrons would operate from advanced bases located, where possible, in close proximity to a corps headquarters; their aircraft would be utilized for close air support along the army front and would also attack close interdiction targets, lying within 20 to 40 miles beyond the front lines. Air strikes would be controlled by army personnel, with maximum use made of field artillery forward observers. Requests for close air support from divisions would be processed at corps headquarters and would be filled from aircraft under the operational control of each corps The Eighth Army, however, would be able to divert aircraft from one corps to another when necessary, and whenever army plans did not require the maximum use of all immediately available corps' airplanes, they would be immediately available for the use of Fifth Air Force, just as it was anticipated that the army would receive additional support from the Fifth Air Force during periods of major ground activities. The Air Force would continue to accomplish aerial photography, reconnaissance, and radar-controlled air strikes for the ground forces.[113]

By some strange type of logic, General Van Fleet had determined that application of the Army's "school solution"—attachment of aircraft squadrons to ground corps—would solve all of the deficiencies, with the one notable exception that it would not provide aircraft especially designed for close support.

Asked to comment on an information copy of the Van Fleet letter, the Fifth Air Force noted that it "attempts to justify Army operational control of tactical aviation units." Assumptions implicit in the letter were that increased fire power for ground forces would reduce casualties, that ground fire power must be increased in the form of close air support, and that additional fire power from daily, continuing, and regular close air support of three Marine squadrons would be sufficient to meet the Army's usual requirement for increased fire power. The letter proposed that the army commander would assume responsibility for interdiction and air attacks as far as 40 miles beyond the front and against targets which the corps commanders considered to have an immediate and direct influence in the battle area; through simple and direct procedures of daily cooperation between Fifth Air Force and Eighth Army, the army commander already possessed the mechanism to manage such air effort. The Eighth Army commander had always concurred with the daily planning allocation of air effort in Korea. The Fifth Air Force questioned whether, under normal allocations of artillery, a ground commander actually required the air supplement to his organic fire power: with rare exceptions for special targets, the Fifth Air Force believed, corps and divisions had no need for the fire capability of the airplane within the range of their artillery. A moderately well trained battalion of artillery could concentrate its fire on a target within range in four minutes or less, and could shift its fire to a new target in the same time Targets within a four-mile range of the artillery could usually be saturated, and targets up to 12 miles or more could be attacked. Artillery was a great deal more accurate than bombing, required less attempts to hit a target, and cost far less to support logistically. There was danger that substitution of more expensive and less accurate aircraft for ground fire power would result in the aircraft's interference with full employment of ground weapons. The Fifth Air Force agreed that close air support was capable of development and improvement, but the Korean situation was not recommended to furnish criteria for close air support: although U.S. Army and Marine divisions were at full strength and were fully equipped, they still justified close air support because of their extended frontages, by the fact that their corps

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artillery support had been much less than was furnished in Europe in World War II, and by the fact that artillery ammunition was strictly rationed. The Fifth Air Force did not believe that air-ground experience in Korea would be typical of future air-ground operations.

In reference to General Van Fleet's specific criticisms of Korean air support, the Fifth Air Force was at a loss to determine what would have been sufficient numbers of close air support sorties. In emergencies the whole Fifth Air Force capability had provided close support for Eighth Army units, but the Fifth Air Force professed inability "to provide for each ground unit prorata shares [of close support] which would be approximately equal to the greatest demand of any one of them." The frequent shifting of Eighth Army front lines in Korea had made location of lateral airfields across Korea extremely difficult, but Fifth Air Force units were operating from K–13, K–16, K–46, and K–18 despite the fact that poor Korean transportation made logistic support of interior airfields very difficult. Twenty-five minutes was the maximum round trip "in flight" time which could be saved by operating aircraft from airfields as close to the front lines as were corps headquarters; the "turn around" time for such aircraft and their maintenance periods when operating from unimproved airfields near the front lines would negate this time advantage.

If General Van Fleet's recommended system of corps control were followed, the Fifth Air Force conceded that it would eliminate the small administrative delay occurring in the JOC, but since corps' FSCC would take over a function analogous to that exercised by the JOC there would be no reduction in the number of administrative steps and probably no saving of administrative time lag. The time required to place an aircraft on target could indeed be improved if an air unit operated day after day in the same area, but any system that was to have general application could not depend upon memorized terrain and targets but had to depend upon navigation to any geographic section and then direction to targets. A system which relied upon terrain specialists was at a disadvantage in mobile warfare when unfamiliar terrain was constantly encountered. The Fifth Air Force agreed that the Mosquito, a vulnerable aircraft without armor or armament should be eliminated from the battle front; it therefore recommended that development be undertaken of a new communication system providing at least 125 ground radio stations for the control of a field army's close air support. While it was agreeable to the transfer of so much of the TACP function as could be more efficiently managed by the army, the Fifth Air Force pointed out that a forward air controller was supposed to provide the experience and understanding of a combat pilot * while his air-ground operations counterpart, the S–3 Air, was intended to provide the experience and understanding of an army officer. In the air-ground operations system, the FAC and the S–3 Air were intended to work as a team. The Van Fleet complaint that USAF had developed no special aircraft and armament for air support could not be answered by the Fifth Air Force, but it supposed that what was desired was an aircraft developed especially to provide fire power for ground troops.

In summary, the Fifth Air Force comments demonstrated what might well be the future effect of the adoption of any such policies as those proposed by General Van Fleet: [114]

> A superior technology will be depended upon to win a future war. The United States Air Force organization, command, and concepts have been developed specifically for employment of limited air resources from a superior technology. The objective of the Air Force is to provide maximum air capability through efficient management of available air resources, and to employ this capability within sound tactical concepts for its maximum effectiveness. The support of air capabilities is drawn from the same limited system that supports ground fire power. If this limited system is unable to meet the modern battlefield's demands for resources and fire power, and they are to be met

*Nearly all Army studies emphasized the charge that Forward Air Controllers lacked familiarity with ground force organization and employment. This was not always the case. Lt William D. Bush, a former paratrooper who had become a Sabre pilot, was detailed as a FAC and jumped with the 187th RCT at Munsan. He was killed there in action on 26 March 1951 while leading a paratroop platoon which had lost its regular commander (Hist 4th Ftr.-Intr Gp., Feb.-Apr. 1951).

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> by the diversion of air resources and logistic support to the role of ground fire power, a reduction in air capabilities must be the result. Since the fire power to support ground troops does not require an air capability, the basic letter proposes this diversion of air resources as a matter of expediency. A policy of expediency that diverts air resources from the organization and command structure which specializes in giving them greatest effect, and from tasks that require air capability, must finally result in bankruptcy of our air capability

What action was taken by General Ridgway upon the Van Fleet proposal that the 1st Marine Air Wing be put under operational control of the Eighth Army is not apparent, but no change was made in the existing system whereby commander Fifth Air Force provided close air support of the Eighth Army and exercised coordination control over the 1st Marine Air Wing. Dissatisfaction nevertheless continued within Eighth Army, particularly in X Corps where an observer team of the Joint Tactical Air Support Board in mid-February noted: "Within X Corps . . . there was a desire for the Army to have tactical air allocated directly to the Corps commander to be employed as desired." [115] The matter of allocating operational control of the 1st Marine Air Wing to Eighth Army was again raised at a CINCUNC briefing on 1 August 1952, and at that time General Clark directed that General Van Fleet be informed that his proposed plan whereby the Marine air wing would be used exclusively in support of the Eighth Army could not be favorably considered [116]

While chief of Army Field Forces, General Clark had been in the midst of the "burning issue" relative to "the control and adequacy of close air support for the infantryman," but, as he later explained it, he "hadn't come out to the Far East to aggravate this basic difference of opinion between the Air Force and the Army." [117] Having studied the elements of Eighth Army dissatisfaction with its air support, General Clark on 11 August 1952 issued the following opinions. He confirmed his faith in the Joint Training Directive for Air-Ground Operations, noting that it had been "established only after the most comprehensive and exhaustive joint deliberation," was based "on a vast reservoir of experience data amassed on all fronts in World War II," and "presents the composite view of senior members of the Armed Forces who had the longest and most responsible experience in close support during World War II" Clark further stated: "I consider that much of the criticism is not fully justified—principally because the criticism is based on factors that are entirely unrelated to the system itself." First, there was apparent misunderstanding among Army and Air Force personnel that air-ground operations in the Korean combat zone were the direct result of policies matured in common deliberation between Army and Air Force commanders. Second, there was a tendency at all ground levels to give the Air Force credit for greater capabilities than it possessed, and thus when air results were less than expected, ground officers tended to level blame at the system rather than to recognize that the fault lay in their own lack of appreciation of the limitations and capabilities of the air arm Here, General Clark thought it necessary to remind ground officers that. "The normal supporting weapons in division and corps should be fully utilized as a matter of first priority. Calls for close air support should be made only when available ground weapons are fully employed and cannot furnish the required support." Third, and of great importance, was the simple fact that company, battalion, regiment, division, and corps officers did not appreciate that the Fifth Air Force was assigned missions of greater scope than those normally assigned to a tactical air force, that the Fifth Air Force was utilizing no small part of its very limited means to further CINCUNC's over-all mission by exploiting the intrinsic capabilities of air throughout North Korea. General Clark recalled that during the CCF offensives in the spring of 1951 "every plane that the Fifth Air Force could get airborne and that possessed a close support capability was on that mission The full weight of FEAF BomCom was also thrown against the enemy." When the ground front stabilized in July 1951 a transportation interdic-

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tion program had been instituted with the complete concurrence of the Eighth Army commander and his full knowledge that aircraft to be made available for close support would be limited in number. Fourth, any comparison of the Army and Marine systems for air support was faulty in premise in that the two systems were designed for completely different types of ground operations and necessarily had entirely different allocations of artillery and supporting air. The Marine system was too expensive in personnel and equipment and its requirement for aircraft was too great to permit its adoption in tactical air force-army use where 60 to 100 divisions might be employed. Fifth, the tactical air force had probably been its own worst enemy in expressing its missions as tasks: to gain and maintain air superiority, to isolate the battlefield, and to provide close support of ground forces. Army officers often incorrectly assumed this statement of missions to mean that air support was in third priority. General Clark suggested: "The Air Force might well state the same thought by indicating that the Tactical Air Force has but one mission, which is: IN CONJUNCTION WITH SURFACE FORCES TO INFLICT MAXIMUM DAMAGE THROUGH AIR ACTION ON ENEMY AIRCRAFT, MATERIEL AND INSTALLATIONS, AND PERSONNEL."* This mission would be accomplished by three types of action: anti-air, anti-materiel and installations, and anti-personnel. In cooperation with the Army commander, the Tactical Air Force commander would engage the enemy with a combination of these actions depending upon the over-all tactical situation. Sixth, the deficiencies noted in the close support system employed in Korea—an excessive length of time required to get air ordnance to the target and the accuracy of delivery of such ordnance—could and had to be countered by constant cooperative training by air and ground forces. While he thus gave general endorsement to the extant tactical air force-army system, General Clark nevertheless directed that Eighth Army and Fifth Air Force would carry out experimental training looking toward "perfecting the present system." "The Korean battlefield," he proposed, "should now provide an excellent laboratory to test the methods which have been developed and improved since World War II." [118] Such experimental training would be conducted in Korea during the spring of 1953.*

Combined Air-Ground Training: Many of the abuses of the tactical air control system were attributable to a fundamental lack of understanding of the system on the part of subordinate ground and air personnel. To the end of disseminating information concerning the doctrine and techniques of the approved air-ground system the Fifth Air Force made a good deal of progress, with the result that the extant system ran smoother and more efficiently. It would appear, however, that little progress in education could be made with the hard core of ground officers, chiefly located in divisions and corps headquarters, who obdurately opposed the existing system of close support.

At the recommendation of Eighth Army, which doubted the practicability of operating a formal school in Korea, most training had to be accomplished by visits of air-army teams to front line ground units. The Fifth Air Force also sponsored orientation visits of key air and ground personnel to its headquarters and to the 6147th Tactical Control Group. The training film, "Control of Tactical Air Operations," was shown to divisional and regimental staffs. During November 1951,

*This CINCFE letter was drafted by Brig Gen Gilman C Mudgett, AC/S G-3 FEC in coordination with FEAF and Fifth Air Force Thoughts such as this which stated that the Fifth Air Force possessed a coordinate mission with the Eighth Army in the destruction of Communist ground forces in Korea represented a great change from the air force mission assignment as given by Generals MacArthur and Ridgway (*See* Chap. III, pp 73-74) Doubtless these thoughts represented the touch of Brig. Gen Jacob E. Smart, D/Opns FEAF, who desired "subordinate units (particularly the Air Force units) . . to be made aware the CINCFE and his staff recognize that the Army, Navy, and Air Force are each responsible for attaining the theater commander's over-all objective, and thus put an end to the opinion so often expressed or implied that the Eighth Army is responsible for winning the Korean war, and that the role of other Services is to support it in its effort" (Ltr, Brig Gen Jacob E Smart, D/Opns. FEAF, to Brig Gen Gilman C Mudgett, AC/S G-3 FEC, 25 July 1952)

*These air-ground "experiments" will be recorded in AHS-127 USAF Operations in the Korean Conflict, 1 July 1952-27 July 1953

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12 officers of the 2d Division attended the 3-day period of orientation for forward air controllers at the 6150th Tactical Control Squadron (Ground).[119]

Maintenance of a sound understanding of the principles of air-ground cooperation, however, was made most difficult by air and ground personnel rotation. By the autumn of 1951 air liaison officers reported that the Eighth Army replacement turnover had brought in new people unfamiliar with close air support, similarly, the air emphasis upon interdiction, combined with rotation, resulted in such a loss of close-support experience that many flight and element leaders had no more than one or two such missions to their credit. Visiting Korea in January and February 1952, the representatives of the Joint Tactical Air Support Board reported that: "The most outstanding discovery of the tour was the quite apparent lack of indoctrination within both Army and Air Force units in the fundamental principles and concepts of Tactical Air Operations." [120]

Recognizing the loss in its pilot close-support experience, the Fifth Air Force began rotating a week's close-support duty among its fighter squadrons in the spring of 1952. In February 1952 CINCFE additionally directed FEAF to expand the short course, which had been conducted by the 314th Air Division and the XVI Corps at Johnson Air Base since September 1951, into a permanent FEC Air-Ground Operations School. This one-week school was designed to indoctrinate selected Army and Air Force personnel, both from units already in Korea and from the flow of replacements to the Far East.[121] Once again it was demonstrated that effective close-support operations depend heavily upon continuous air-ground orientation training.

AIR WEAPONS AND TACTICS

The Problem of Jet Aircraft Operations: Describing early Korean operations staged from Itazuke Air Base, a Marine pilot recollected that it was always a pleasure to taxi out in an F4U Corsair with 8 rockets or 4 x 250-pound fragmentation bombs and a tank of napalm or 1 or 2 x 500-pound bombs after a flight of F–80's had taken off with their load of 2 to 4 rockets "The personnel would come for miles just to watch you take off," said the Marine pilot, "and they were probably making bets that you wouldn't make it. But the old bent wing buzzard always made it." The author of these patronizing remarks would no doubt have been surprised if he could have witnessed the ordnance hoisted by F–80C aircraft of the 8th Fighter-Bomber Group in a dawn-to-dusk effort on 11 March 1952: with 51 F–80 aircraft available, the group flew 254 effective sorties against enemy troop and supply concentrations in the vicinity of Mulgae-ri, dropping 153 tons of 1,000-pound and 500-pound bombs, 124 tons of napalm, and firing 46,200 rounds of .50-caliber ammunition.[122] Actually neither of these incidents was fairly representative of typical operations: the first came at a time when the Fifth Air Force was converting its jet interceptors into fighter-bombers and the second represented attacks made from Suwon airfield (K–13) against a target within a range permitting internal fuel loads and allowing each F–80 to carry as many as four 1,000-pound bombs.

The Fifth Air Force had nevertheless made great progress in adapting jet fighters to the carrying of ground-attack ordnance in a combat situation which demanded maximum range and armament loading. From the early phase of the Korean war, Fifth Air Force officers had shown commendable ingenuity in adding 265-gallon wing-tip tanks to extend the F–80C range, in perfecting 5-inch HVAR rocket tactics, and in attaching bomb racks to planes originally designed as jet interceptors. Upon its arrival in the theater, the F–84 jet fighter had been developed as a fighter-bomber replacement for the tired F–80's. "Aside from endurance," noted an Army operations evaluation team in February 1951, "it is difficult to determine any marked

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deficiency in ability of the F–80 or F–84 to bomb, napalm, rocket, or strafe a target." This team also remarked that the USAF-Army tactical air control system had been sufficiently flexible to incorporate jet fighter-bombers, it wondered what would be the result upon the Marine control system's requirement that aircraft remain on station as long as three hours once hostile air opposition demanded the replacement of Navy AD dive-bombers and Marine F4U fighter-bombers with modern jet type aircraft.[123]

Proximity Fuzing of Bombs: Use of the proximity or VT-fuze resulted directly in thousands of casualties to the enemy in his spring offensives of 1951. In principle, the fuze operates as a radar, receiving its impulse for air detonation from reflected radio energy; it consists of a minute radio transmitter, receiver, power supply, and electrical firing circuits, as well as various safety devices. Upon activation, the fuze transmitter radiates radio energy in appropriate directions into the space around it; when this radiation encounters an obstacle, some of it is reflected back to the fuze, triggering off a detonation. From the date of its operational tryout on Iwo Jima in February 1945 the fuze had unquestionably achieved a higher degree of effectiveness in air bursting bombs than the mechanical time-fuze. The VT-fuze was not extensively utilized in the Korean conflict before the spring of 1951 chiefly because ordnance personnel were unfamiliar with it: a FEAF Bomber Command mission had dropped several bombs with proximity fuzes, but when one bomb, without the proper arming delay device, had exploded in the air near a B–29, use of such fuzes had been discontinued Early in 1951 a team of ordnance experts of the USAF, the Army, and the Bureau of Standards toured Japan and Korea to effect refresher training of air and artillery officers, and in the course of its work this team demonstrated forgotten techniques in the use of VT-fuzes.[124]

All that was required in order for the B–29 medium bombers to employ proximity-fuzed 500-pound bombs was an already-developed arming delay device, and thus early in January 1951 such bombs were used by the B–29's against hostile personnel targets. Later in the spring the combination of proximity-fuzed 500-pound demolition bombs and the MPQ–2 radar-controlled night bombing technique made for highly effective attacks against enemy ground forces. The bar-type (M–168) fuze, however, could only be used on 500-pound bombs, and bomber commanders believed that a fuze suitable for employment on 100-pound GP bombs would be even more effective in their night antipersonnel strikes.[125]

The employment of proximity-fuzed externally racked bombs on fighter aircraft occasioned a considerable amount of apprehension among operations officers in Fifth Air Force because a bomb which became armed while still on the aircraft would undoubtedly prove fatal to both plane and pilot. On 26 January 1951 the Fifth Air Force office of operational engineering, in cooperation with the 49th Fighter-Bomber Wing, undertook the design and testing of an absolutely positive safety device The result was an L-shaped piece of metal, attached to the bomb rack so as to extend down and prevent the fuze vane from rotating until the bomb had left the aircraft. Tests demonstrated that the bomb could be carried in excess of 500 miles per hour without hazard, and FEAMCOM easily fabricated the safety devices, permitting F–80's to carry proximity-fuzed bombs during February 1951.[126] Since such bombs could be accurately launched from altitudes above effective ground fire and precisely detonated at altitudes for the most effective burst coverage of ground targets, they proved excellent both against enemy flak and personnel groupings. In May 1951 the safety devices permitting the use of VT-fuzed bombs by F–84 fighter-bombers were fabricated,[127] and in June similar devices were provided for the F–51's of the 18th Fighter-Bomber Wing [128] Although the Wright Air Development Center informed FEAF in February 1952 that VT fuzes could not be used successfully in dive bombing, the successful expenditure of some 6,700 bombs so fuzed in the previous 4 months, mainly in flak-suppression missions, convinced FEAF differently. Both 500-pound GP and 260-pound frag bombs had been used; dive angles had varied from

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45° to 60° and indicated air speeds at the release points had varied from 350 to 500 miles per hour in conventional and jet fighters The minimum safe release point was 4,000 feet true altitude; some releases were made in train with .1-second interval, while others were released simultaneously. Some early bursts were experienced, but no aircraft received damage.[129]

Aircraft Rocket Developments: During the first months of the Korean conflict Fifth Air Force jet fighters had made great use of 5-inch HVAR rockets, chiefly because they were the most powerful weapon immediately available Tests made against captured enemy materiel indicated, moreover, that the 5-inch HVAR could knock out a Russian-made T–34 tank.[130] These rockets, however, were subject to frequent malfunctions and often damaged the launching aircraft.[131] Beginning in January 1951 fighters made some use of 5-inch cavitized rocket heads with VT fuzes, effectively attacking enemy trucks, pack animals, and camouflaged aircraft. The fuze (M–403) for these rockets, however, proved unsafe for use by fighter-bombers until positive safe arming features could be provided.[132] Mustangs, F–80's, and F–84's all demonstrated their ability to lift and launch the monster 11 75-inch Tiny Tim rockets; the 27th Group used several Tiny Tims against concrete hangars at Wonsan in January 1951 and their terrific power of penetration appeared to have some use against tunnels,* but otherwise there were few targets in Korea which warranted use of the huge rocket.[133]

Because of the many imperfections of the 5-inch HVAR, the USAF procured test quantities of a Swiss manufactured 8-cm. or 80-mm Oerlikon rocket, which in tests at the Air Proving Ground Command demonstrated an accuracy of fire 200 per cent better than the HVAR: pilots could obtain hits against tank targets with one out of three 80-mm. rockets where some 20 HVAR's were required for a hit A combination of fin-spin stabilization and a higher velocity increased accuracy, contributed to a flatter trajectory, and permitted firing at greater ranges; an F–84E, moreover, could carry 24 of the 80-mm. rockets instead of eight 5-inch HVAR's.[134] In July 1951 an Air Proving Ground test project, with the code name of SWATROCK, was established with the 49th Fighter-Bomber Wing, and by the end of August the 4 F–84E's assigned had flown 14 combat missions and had fired 900 of the Oerlikon rockets. The combat suitability was completely established for the new weapon, which possessed superior accuracy, higher hit probability, and good ground handling qualities.[135] Test hits on a captured T–34 tank with high explosive antitank (HEAT) heads penetrated up to 11 inches of armor steel, but the SWATROCK detachment was frustrated in its efforts to locate live Communist tanks. Eventually, three aircraft and pilots were lost to enemy ground fire when they persisted in flying armed reconnaissance in known armored division areas where flak was heavy.* [136]

The inability of the SWATROCK detachment to locate hostile tanks brought up a matter which Fifth Air Force operations analysis experts had broached earlier: screening an arbitrary 4-week period (25 January to 21 February 1951) the analysts discovered that 55 per cent of the total rocket capability in that air force had been utilized whereas rockets were recommended for less than 7 per cent of the targets attacked, and then only as second choice weapons. This analysis indicated that more rockets were being expended than was profitable, especially since they were at a cost of reduced bomb and napalm expenditures. Questioning whether a lesser performance weapon having a high explosive warhead of only 7.5 pounds against an over-all weight of 135 pounds was economical, the analysts recommended against general employment of HVAR's and advocated some development that would permit bombs and napalm to be carried on a fighter-bomber's rocket mountings.[137]

Employment of Napalm: At the end of October 1950, tests of the incendiary napalm

*See Chap V, p 143

*Although SWATROCK demonstrated the combat suitability of the 80-mm Oerlikon rockets, sufficient stores of the rockets and adapters for fitting them to F-84 fighters were not available in quantity to the Fifth Air Force before June 1953 (FEAF Comd Hist Rpt, June 1953, p 29)

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against captured T–34 tanks at Taegu had reaffirmed that the fire bomb was a particularly effective antitank weapon,[138] but the full extent of its destructiveness awaited a survey of derelict North Korean armor in the regions overrun by the UN ground forces. In the first place, air was shown to be the principal destructive force against North Korean armored vehicles; of a total of 595 North Korean tanks destroyed, prisoners of war credited the air force with 452, or approximately 75 per cent of the total.[139] By March 1951 an examination of destroyed tanks further revealed that 71 per cent had been burned out by napalm as against 21 per cent destroyed by rockets.[140] Napalm was accordingly considered to be the primary antitank weapon in Korea.

For a time napalm was also enthusiastically received as the best general purpose air weapon in the Korean theater, but such a generalization sprang from a variety of circumstances peculiar to the region and the time. Until the spring of 1951 hostile ground fire and flak were not severe, and the utilization of napalm, which requires an extremely low and flat pass at relatively slow speed, did not cause the high loss rate sustained in World War II whenever the incendiary was used on a large scale. The flimsy construction of buildings in Korea also increased napalm's incendiary effect. With close-support sorties available in abundance so that an area could be well saturated, napalm was a suitable antipersonnel weapon.[141] While it could not penetrate into the deep cave fortifications which the Communists dug back into the Korean mountains, it was effective against their more exposed firing points, foxholes, and communications trenches. Captured enemy documents revealed that the Communists recognized these advantages and limitations: a Chinese Sixty-fifth Army order required that field works be constructed on high ground and protected by diversion ditches and removal of grass and other inflammable material in the vicinity; exposed emplacements would be augmented by deep dugouts, into which troops would move under cover of the smoke from the napalm fire.[142]

Mustang fighters had possessed the ability to deliver napalm upon their arrival in the Far East because they had sufficient internal fuel to permit the loading of 110-gallon drop tanks of the incendiary on their wing shackles, but, lacking sufficient range without external wingtip tanks, the F–80's had been unable to load either napalm or bombs until the fall of 1950, when midwing pylons were installed. The F–84 posed still another problem: the standard 110-gallon tanks being locally manufactured in Japan and used by the F–51's and F–80's were not acceptable for use on the F–84E since when they were released at speeds greater than 330 miles per hour, they twisted and lifted up, damaging the plane's wings and fuselage. FEAMCOM therefore designed a 90-gallon napalm tank which proved acceptable in tests held on 27 December 1950.[143] These 90-gallon tanks were also more satisfactory on the other aircraft, being easily installed and having much less drag than the older 110-gallon tanks;[144] in February 1951 FEAMCOM therefore ceased production of the larger tank, and early in March production of the new 90-gallon tank was sufficient to meet daily requirements of Korean operations.[145] With all fighter aircraft making extensive use of napalm against the Communist spring offensives, the supply of M–157 fuzes, used in the M–15 and M–16 igniters manufactured in Japan, became critically short during March 1951; only by expedited USAF procurement, emergency rationing, and conversion of hand-grenades into igniters was FEAMCOM able to meet the shortage.[146]

The 90-gallon tank permitted all fighters to carry napalm, but neither it nor its predecessor allowed any refinement of the "splash" technique in delivering the weapon. Fighter pilots had to lob the tanks on a target from low altitudes, relying on a hit or near miss and the dispersion effect of the napalm to do the work. What was needed was an aimable or ballistically sound item to be used as a container for the napalm; USAF was also aware that aerodynamic problems would appear at speeds above Mach .95 unless suitable shapes for the fire bombs were designed.[147] With the increase of Communist ground fire, moreover,

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the flat passes at 100 feet across a target necessary to deliver napalm were hazardous. In its tactical doctrine the 136th Fighter-Bomber Group therefore recommended an indicated air speed of 450 miles per hour across a target and evasive action immediately after release and during pull-up, if no flak was observed, it was desirable to get above small-arms range (2,000 feet) as rapidly as possible, weaving the plane on the pull-up, but if flak was observed it was advisable to apply full power, remaining as low as possible until out of effective range, when the plane could safely regain altitude.[148]

More as an experiment than anything else, 315th Air Division C–119 transport aircraft demonstrated their ability to make TADPOLE-controlled night airdrops of 55-gallon fuel drums filled with napalm on the first three days of October 1951. This project, known as SNOWBALL, sent small formations of C–119's, each loaded with 10 drums of napalm, over an enemy sector at 10,000 to 11,000 feet, launching their napalm packages at 150 to 170 knots airspeed Friendly ground troops reported that the target areas were covered by fire, and the C–119's met no enemy anti-aircraft fire. A partially simulated mission at the Tori-shima bombing range by 72 C–119's, each capable of transporting 30 drums of napalm, gave an estimated effective bomb pattern of 1,200 feet by 3.5 miles, demonstrating the feasibility and practicability of airdropping mass quantities of napalm.[149] But the C–119's possessed no oxygen equipment needed for operations above 10,000 feet, and if such equipment were to be installed, it would be in dangerous proximity to the napalm loads; moreover, no tactical prospect for SNOWBALL missions appeared, and in January 1952 the last of the deteriorating napalm packages were expended on a training mission.[150]

Other Air Efforts to Increase Its Antipersonnel Capability: As a part of its general effort to impart the greatest possible antipersonnel capability to its fighter-bombers as well as to increase their bombing effort, the Fifth Air Force continually experimented with bomb adapters for rocket posts, the objective being to permit the carrying of bombs on the pylons and additional frags or smaller bombs at the rocket positions. A project permitting the carrying of 260-pound frag bombs on F–51 rocket rails was attempted in July 1951, but 6 extra manual releases and an intricate system of pulleys and cables were required for such an operation, and this mock-up was obviously impracticable.[151] In October 1951 the 8th Fighter-Bomber Wing introduced rocket-rail bomb racks which enabled their F–80's to carry a total of four 260-pound bombs, or four 100-pound and two 500-pound bombs, but the drag and weight lengthened the take-off roll and reduced effective range so appreciably as to make the installation impracticable.[152] That same month the 49th Fighter-Bomber Group perfected a suspension device capable of handling either a 100-pound GP M–30, a 250-pound GP M–57, or a 260-pound frag M–81 bomb.[153] While a production model rocket-post adapter bomb rack for F–84's was developed, further tests showed that the carrying of bombs on the rocket posts in addition to the normal pylon load reduced range from 15 to 20 per cent and increased the take-off roll by a like percentage. The system, moreover, held a great number of defects and was calculated eventually to result in a structural failure of the overloaded rocket posts. In view of the limitations in range and mechanical defects, the Fifth Air Force did not recommend the carrying of bombs on rocket rails.[154]

New developments also promised to furnish an antipersonnel weapon superior to frag bombs and napalm; this was the small, inert HAIL* missile which when released in great numbers from a B–29 hopper or a fighter-bomber trap-door-equipped belly tank at 10,000 feet would shower to earth with sufficient gravity-impelled force to pierce a steel helmet. The military potential of the weapon could be established from the fact that a B–29 hopper could hold 80,000 HAIL missiles, and yet have a ground dispersion pattern on the order of 4 missiles per square yard.[155] The

*This project was first called HAIL but when this was thought to be too descriptive the name of the weapon was changed to LAZY DOG

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FEAF target analysis division believed that HAIL missiles could be employed profitably for flak suppression, against airfield and bridge construction personnel, or against troops in the field in offensive concentrations. Although the missiles and dropping apparatus were manufactured in Japan in the summer of 1951, no suitable targets presented themselves so long as the Communists remained dispersed and dug in.[156]

Evaluation of Air Weapons by Communist Prisoners: Following the defeat of the Communist spring offensives of 1951, prisoners of war taken by the UNC were interrogated concerning the psychological and physical effects of UN weapons. One POW study panel comprised representatives of the Fifth Air Force operations analysis office, the Air University Far East Research Group, and the RAND Corporation. While the panel's conclusions were tentative and differed somewhat from those reported in another interrogation conducted in the autumn of 1950,* they were probably indicative of the psychological effect of fighter-bomber weapons in front-line areas against the all-out Communist attacks.

This Air Force study reported that POW's feared air and artillery about equally (with infantry weapons being judged a much smaller demoralization) and most of them thought that air and artillery had inflicted about the same number of personnel casualties. Communist medical personnel captured, however, thought that more casualties were inflicted by artillery. The psychological impact of a weapon was seen to be enhanced when such weapon was not possessed by the troops attacked by it, and weapons which could be seen and that permitted some measure of evasive action tended to be feared less than those which struck without warning, as did jet fighter-bombers or sudden artillery barrages. The continuity of attack appeared to add considerably to the demoralizing effect of a weapon. Napalm was the air weapon most feared by combat POW's; strafing ranked second; and rockets were least feared. Air weapons appeared to have, relative to their own casualty inflicting power, a greater intimidating or fear provoking character than did artillery and infantry weapons.

Although the data were too fragmentary to provide any firm foundation as an air weapons evaluation, the POW's interrogated believed that napalm was the most effective antipersonnel weapon employed by UN fighter-bombers, with the exception that a good number of them thought that strafing would be more effective against exposed troops in flat country. Napalm was thought most effective in hilly country, regardless of whether troops were dug-in. Rockets were believed to have their best use against dug-in troops, either in flat or hilly country, while bombs were thought to be more appropriate when troops were dug-in in flat terrain. POW opinion was sharply divided on the value of strafing: in most terrain strafing was thought to be the least effective weapon although many POW's considered it the most effective means of attack against exposed troops in flat country. The study dealt almost entirely with fighter weapons; MPQ–2 attacks were not considered.[157]

Other captured documents and POW interrogations attributed a heavier share of Communist casualties to the tremendous UNC artillery action during the last phase of the 1951 spring campaign. An order issued by the NKPA 27th Division attributed 70.5 per cent of its wounded in action and 70.7 per cent of its killed in action during the May offensive to UN artillery fire.[158] An Eighth Army interrogation of Red Chinese prisoners, captured all across the front late in May, indicated that 60 to 70 per cent of enemy casualties were attributed to artillery fire; one POW asked where the UNC had obtained automatic artillery.[159] While the Air Force and Eighth Army interrogation studies appear somewhat inconsistent, this was in no wise the case: the Air Force interrogations contacted POW's captured in March, April, and May 1951, while the Eighth Army study was limited to action during late May 1951, when UN artillery fire was in a peak employment.

Jet Aircraft as Fighter-Bombers: Korean operations of 1951 permitted the Fifth Air Force to evaluate the capabilities of the several

*See AHS–71, pp 49–55

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types of USAF fighter aircraft in the role of fighter-bombers. The superiority of jet fighters to conventional propeller-driven models, generally indicated in the fall of 1950, was clearly demonstrated when the entry of the Chinese forces brought the MIG–15's and greatly augmented antiaircraft artillery into the conflict. While the F–51D still possessed an operational radius greater than Fifth Air Force jets (790 miles) and could reach any target in the attack program with two 500-pound bombs and six 5-inch HVAR's, or two tanks of napalm instead of the bombs, the Mustang, with its slower speed and liquid coolant system, could not do combat with a MIG and was very vulnerable to small-arms and automatic-weapons fire.[160] What was true of the F–51 Mustang—vulnerability to ground fire and too slow speed for modern combat—was also the case with Navy and Marine F4U Corsairs and AD dive-bombers Vice Adm. H. M. Martin, commanding the U.S. Seventh Fleet, wrote that: "The obsolete, propeller type aircraft should be replaced with modern dive bombers as soon as possible." [161] Although AD's and Corsairs were highly praised by General Almond as ideal close-support aircraft,[162] Admiral Martin thought that increasing attrition rates from enemy ground fire made it evident that neither of the planes was fast enough, a deficiency which would be even more marked if they encountered enemy air opposition [163]

A little more than a month after his 27th Fighter-Escort Wing entered operations in Korea, Col. Ashley B. Packard* stated flatly that "The F–84E is the best ground support jet in the theater today" [164] A year later the Fifth Air Force agreed: "Considering range, bomb load, fighter capability and speed the F–84 is the most versatile fighter-bomber in use in this theater." This decision—given in April 1952—was naturally subject to the qualification of varying states of pilot technique. The F–84E, however, had the greatest maximum radius of the jets (650 miles with external fuel and maximum ammunition) and was therefore capable of deep penetrations and consequently was subjected to more frequent attacks by enemy aircraft. It could carry two 1,000-pound bombs and four 5-inch HVAR's for a combat radius of 400 miles. The F–80C, as extensively modified by Fifth Air Force technicians, could still carry the greatest bomb load for short distances: where the target lay within 100 miles of the F–80 base, the plane could carry four 1,000-pound bombs plus eight 5-inch rockets, or 4 tanks of napalm plus 8 rockets, or four 265-pound bombs on the rocket post adapters in place of the 8 rockets. This more than two-ton bomb load was equivalent to the pay load of a B–17 bomber in World War II and represented a probable ultimate in getting the most out of a plane which was not originally designed to carry bombs. With both the F–84 and F–80, runways and temperature governed ordnance loads; even with JATO the jet aircraft could not carry maximum ordnance loads from the Korean runways in use during the summer months of 1952.[165]

While the jet fighter-bombers had surmounted problems of range and ordnance in Korea, and the improving Korean airfields would assist them to attain maximum performance, not even the F–84E could meet the MIG–15 on equal terms, a considerable hindrance when bombing targets appeared within MIG Alley. During January 1951 for experimental purposes the 4th Fighter-Interceptor Wing had maintained from four to eight F–86A Sabres at Taegu (K–2) for employment at the direction of the JOC in armed reconnaissance, close support under Mosquito direction, and combat air patrol. The only armament permitted was a full load of .50-caliber, or .50-caliber and two 5-inch rockets, with maximum fuel load utilizing external combat tanks. Pilots had difficulties locating Mosquitoes or found them directing other planes when they arrived, and, in view of the limited staying capability of the F–86 at low altitudes, had to abort a number of close-support missions. From this experience the conclusion was that the F–86A had a short radius of

*Colonel Packard was fatally injured in a T-33 aircraft accident shortly after take-off from Itazuke on 1 May 1951 (Hist 27th Ftr -Esc Wg., May 1951)

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action of 180 miles when carrying two 120-gallon combat tanks and two rockets, a radius which would be cut to 75 miles if the F–86A carried two 500-pound bombs and four HVAR's.[166] During May 1952, however, the 4th Fighter-Interceptor Group again experimented with strafing and dive-bombing, getting well-placed hits with 1,000-pound bombs against Sinuiju and Uiju airfields and the marshalling yards at Kunu-ri on 13 May. On the afternoon of that day, Col. Walker M. Mahurin, the group commander, was shot down by enemy ground fire while leading a dive-bombing mission against Kunu-ri.* [167] Despite this tragedy, the 4th Group had demonstrated that later-model F–86 Sabres could double in brass, and in the spring of 1953 two of the Fifth Air Force fighter-bomber groups would be equipped with F–86F Sabres, modified as fighter-bombers.[168]

*Colonel Mahurin was captured by the Reds and was one of the last UN POW's released at the conclusion of the Korean armistice

Although the Fifth Air Force successfully utilized jet aircraft as fighter-bombers much necessary developmental work was indicated, especially in the field of air ordnance. The 5-inch HVAR had excessive weight and drag when carried on a modern jet fighter; because of their drag the World War II family of bombs also reduced an aircraft's range, speed, and ability to remain in a target area; effectiveness of the M–3 .50-caliber machine gun was marginal against armored ground targets and deficient against air targets; the A–1CM gun-bomb-rocket sight still had major deficiencies in rocketry and bombing accuracy.[169] Similarly, an overwhelming numerical superiority of enemy ground troops, their ability to camouflage and disperse, coupled with the improved but fundamentally limited ordnance-carrying capacity of USAF fighter-bombers, demanded the development of a tactical bombardment system more efficient than the obsolescent B–29's used in Korea.[170] These, however, were matters for the future

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Chapter VIII

RECONNAISSANCE, AIR TRANSPORT, RESCUE, AND WEATHER

In no wise of lesser importance but sustaining rather than participating directly in air and ground combat operations were reconnaissance, air transport, rescue and medical evacuation, and air weather service. While many of the accomplishments of these air activities have been noted, each was of such different functional development as to make them worthy of individual notice.

RECONNAISSANCE

Grossly deficient at the initiation of Korean hostilities, FEAF reconnaissance was expanded so late and so slowly as to be of limited assistance in the defeat of the North Korean armies in 1950. Available for strategic reconnaissance in the Far East was the 31st Strategic Reconnaissance Squadron flying RB–29 aircraft, a SAC unit which was attached to FEAF Bomber Command at the latter's organization. In the summer and fall of 1950 this unit had flown target and bomb damage assessment photography desired by Bomber Command as well as special long-range missions ordered by FEAF. From September until snowfall ended the project in December 1950, the 31st Squadron had also to lend a substantial part of its efforts to photographic mapping of North Korea. Effective 16 November 1950 the 31st Squadron was returned to the United States in a paper transaction and was replaced at Johnson Air Base by the 91st Strategic Reconnaissance Squadron (M), Photo. In December 1951 the 91st Squadron moved to a location near FEAF Bomber Command, establishing the strategic reconnaissance force at Yokota.[1]

Even after the appearance of the MIG–15's the 91st Squadron continued to send its RB–29's to photograph Yalu River targets, often with no more than F–51 escort. Such missions were necessarily hazardous, and one of the first UN planes destroyed by the Red jets was an RB–29, so badly damaged by combined AA fire and MIG attack east of Sinuiju on 9 November 1950 that it crashed at Johnson, killing four crewmen.[2] Seeking to reduce expensive fighter escort, the 91st Squadron attempted night photography without great success in January 1951: due to the limitations of M–46 photo-flash bombs and K–19B and K–37 cameras, the results were poor for photographic interpretation when the RB–29 went above 10,000 feet, but a lower altitude was unsafe over heavily flak-defended areas. Night photographic missions were limited to 40 exposures per sortie, or one per photo-flash bomb. In March 1951 the night photo program was suspended when Bomber Command decided that the expense of time and effort outweighed the tactical value of the photography.[3] Another attempted solution to the MIG problem was the transfer of operational control over Reconnaissance De-

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tachment "A," 84th Bombardment Squadron, Jet, from the Fifth Air Force to the FEAF Bomber Command on 31 January 1951. This detachment, initially comprising three RB–45's and crews, had been dispatched for an original 90 days of temporary duty testing; one of these light bomber types had burned at Midway Island while en route, but the other two had reached their station at Yokota on 28 September 1950. Bomber Command attached the RB–45 detachment to the 91st Squadron for administration and immediate operational control.[4]

Attachment of the two RB–45's to the 91st Squadron greatly assisted the reconnaissance effort available to FEAF Bomber Command, permitting a capability beyond the range of the RF–80 and where hostile activity precluded use of RB–29's. Speed and ability to fly at high altitudes initially permitted the RB–45's to enter highly sensitive areas and obtain photography without fighter escort or danger from hostile AA. In February they photographed such important targets as the airfields at Pyongyang, the cities of Chongju, Rashin, and Chongjin, plus doing strip photography of all marshalling yards and sidings along the main rail line between Pyongyang and Kanggye. During March RB–45's and RB–29's, in addition to routine surveillance of airfields and communications routes, obtained continuous tri-metrical and vertical coverage of all bridges along the 320 miles of the winding Yalu River between Hyesanjin and Sinuiju and photographed all bridges, marshalling yards, and sidings along the rail line from Pyongyang to the border city of Manpojin.[5] When covering Yalu targets the RB–45's operated at up to 42,000 feet, successfully evading MIG's by their maneuverability at high altitude. The RB–45's nevertheless showed limitations in tactical operations: when using full 1,125-gallon tip tanks they required an ideal runway, smooth and 8,000 feet long. For strategic reconnaissance, moreover, the RB–45's range was limited, but on 2 July 1951 the 91st Squadron received a KB–29 tanker detachment, and in a combat mission on 14 July an RB–45 was successfully refueled in flight, three contacts being made and 2,750 gallons of JP–1 being transferred in a little more than nine minutes.[6] Such in-flight refueling greatly expanded the flying time of the RB–45's.

But, as with other elements of FEAF, the principal circumscription upon strategic reconnaissance was the increased activity of the Communist jet fighters. Due to the vulnerability of single aircraft operations, RB–29's required proportionately more escort than B–29 bomber formations. MIG interceptions of the unarmed RB–45's on 9 April and 9 November 1951,* indicated that not even this speedy jet bomber could escape enemy action. A continued build-up of MIG–15's caused FEAF to place MIG Alley out of bounds on 1 June 1951 for all Bomber Command aircraft not having fighter escort.[7] Rather than commit 8 to 16 fighters to the escort of each bomber-type reconnaissance aircraft, however, Fifth Air Force undertook to accomplish all FEAF reconnaissance north of Pyongyang with RF–80's which for several months more would not usually require fighter escort. Based at Kimpo (K–14), the RF–80's could cover all targets to the Yalu in northwestern Korea, and the 67th Tactical Reconnaissance Wing undertook three priorities of Bomber Command photography, ranging in immediateness from first priority which could be picked up by a Bomber Command courier at 0400 hours on the morning following a reconnaissance mission.[8] After June 1951 strategic reconnaissance missions were generally south of Pyongyang, and increased MIG activity in October 1951 further reduced the 91st Squadron's activities by limiting it to operations in the area south of 38°30′ North and east of 127° East: RB–45's with escort could enter the proscribed area but no RB–29's, with or without escort, could enter the MIG-infested zones.[9]

Other theater reconnaissance duties fell within the 91st Squadron capability: in August 1951 a new commitment required daily surveillance of shipping in the northern Japan Sea adjacent to the coast of the USSR, and

*See Chap IV, pp. 113–14

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late in the year two RB–50's were assigned to the squadron to take over highly classified electronics countermeasures reconnaissance. RB–29's and RB–45's when available were also engaged in the large project of photographing Japan for more accurate mapping.[10] After several months of flying little reconnaissance for the FEAF Bomber Command, the 91st Squadron was directed in January 1952 to prepare itself for night flash-bomb photography of North Korean targets. In getting under way with this project the 91st Squadron met the same problems as did the three B–29 wings, whose concern was night photo-flash strike photography.* Initiation of RB–45 night photography had to be delayed, pending arrival of baffle plates for the protection of the aft bomb bay when the forward bomb bay was opened to drop flash bombs: in a premature test mission on 20 February 1952 buffeting of the rear bomb-bay bulkhead caused hydraulic line failure and tore out other equipment. Because of intense enemy flak encountered over most important Korean targets, the reconnaissance bombers would have to operate at over 20,000 feet: an RB–29 test mission over Sinanju at 16,000 feet on 14 February resulted in extensive damage from enemy flak and an emergency landing at Kimpo. At altitudes in excess of 20,000 feet, however, neither the standard K–37 nor the K–19 night cameras had the requisite focal length to secure photography of sufficient scale for adequate bomb damage assessment; the M–46 photo-flash bomb, moreover, did not provide sufficient illumination for photography at such an altitude: an experimental effort whereby three M–46 bombs were banded together failed when the fuzed bomb did not detonate the other two missiles. In April 1952 more powerful M–120 photo-flash bombs arrived in quantity, permitting the RB–29's to secure fairly acceptable night photography with K–37 cameras at altitudes varying from 17,000 to 24,000 feet. Installations of bomb-bay tank shields in an RB–45 and the utilization of M–120 flash bombs produced clear photos from 30,000 feet in the initial mission on 21 April 1952.[11]

Utilizing the new night photography system, the 91st Squadron flew 62 combat-photo missions in May 1952 and, adding this effort to its other tasks, logged the second highest monthly flying time it ever attained.[12] The system nevertheless possessed defects. Removal of the front bomb-bay tank severely curtailed the RB–45's fuel capacity and range. With bomb-bay doors open at airspeeds between 220 and 290 miles per hour, the RB–45 encountered steady and heavy vibration; thus, in order to effect a stable camera platform, the crew had to drop the flash bombs and close the bomb-bay doors prior to the functioning of the first bomb.[13] The RB–45's would therefore be little used as night photography aircraft but would continue to chance MIG interceptions in daylight reconnaissance of safer areas of Korea. In the early months of night photography the RB–29's provided shoran equipment problem solutions necessary for precise night positioning on targets, and, with the limitation that the K–37 camera at high altitude could not secure the 1:10,000-scale photographs desired for proper damage assessment, the system worked well. By December 1952 a representative of the Wright Air Development Center, working in conjunction with 91st Squadron technicians, had what appeared to be the solution to camera difficulties in the RB–29's: a K–22 daylight camera selected for its long focal length, a shutter with modified speed controls, an image motion-compensating mechanism, and a special mount to dampen vibration At any rate FEAF was more satisfied with the solution.[14] Thus by taking to night operations the strategic reconnaissance RB–29's found it possible to escape the Red jets and continue to function over Korea.

At the beginning of hostilities in Korea the Fifth Air Force had been greatly deficient in tactical reconnaissance, having had only the 8th Tactical Reconnaissance Squadron (RF–80) assigned. Due to a USAF-wide shortage in the tactical reconnaissance field, the build-up of units needed in Korea was slowly managed; meanwhile, anachronistic use of

*See Chap. VI, p 184.

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T–6 Mosquito planes somewhat eased the problem of close-in visual reconnaissance, and late in August 1950 the 162d Tactical Reconnaissance Squadron (NP) arrived from the ZI to provide a night potential with its RB–26's. To supply visual reconnaissance the 45th Tactical Reconnaissance Squadron was activated on 3 September 1950, but its RF–51's would not be ready for operations in Korea before the following December. On 26 September organization of the 543d Tactical Support Group (P) gave these units a common parent, and when the 363d Reconnaissance Technical Squadron reached Korea early in October 1950, the organizational framework was in being for an expanded tactical reconnaissance establishment.

The extemporized organization for tactical reconnaissance was far from satisfactory. As established at Taegu (K–2) the 543d Tactical Support Group was made a subordinate and received its operational orders from the 6149th Tactical Support Wing; whereas, performing a tactical air force function, it would have been assigned properly where it was directly under the Fifth Air Force.[15] Logistical support complications arose in January 1951 when rear echelons of the tactical support group and its reconnaissance squadrons were scattered out on Japanese airfields: only a partial alleviation was the assignment of extra housekeeping cadres to the squadrons.[16] Procedural channels were apparently obfuscated, for the 543d Group complained in January of "the many telephone calls, at all hours of the day and night, from higher headquarters in regard to missions. . . . It seemed that everyone wished to have a personal telephone rundown as to the results of each sortie." [17] After a specific request for his services, Col. Karl L Polifka, a pioneer and key figure in aerial reconnaissance, was attached to the 543d Group on 24 January with the purpose of organizing a reconnaissance wing. The result was the activation of the 67th Tactical Reconnaissance Wing effective 25 February 1951 with direct assignment to Fifth Air Force; concurrently, redesignation of units gave the wing the following tactical units: 67th Group (543d), 12th Tactical Reconnaissance Squadron (NP) (162d), 15th Tactical Reconnaissance Squadron (8th), the 45th Tactical Reconnaissance Squadron, and the 67th Reconnaissance Technical Squadron (363d). During March most of the echelons of these organizations were concentrated at Taegu (K–2), and by 1 July 1951 when Colonel Polifka, who had become wing commander, was shot down and killed, the reconnaissance wing was beginning to function as a unit.[18] Personnel for wing supporting organizations, however, remained scarce. Not until 22 August, when the 67th Wing and its subordinates completed a movement to their new station at Kimpo (K–14), was the rear echelon cleared out at Tsuiki and the whole tactical reconnaissance establishment concentrated at one base.[19]

That the tactical reconnaissance system was still insufficient when the Chinese Reds attacked has been noted.* The main crossing points from Manchuria were nevertheless established and kept under continuing observation. Flak positions were identified for plotting. Night photography not uncommonly revealed troops marching toward the battle line. Enemy tank and truck movements were flashed to the JOC, and in two instances 6 tanks and 7 locomotives were knocked out in the follow-up of flash reports.[20] Between 21 and 30 December an all-out repetitive photo mosaic coverage of a 57 x 40-mile section north of the battle line consumed the entire effort of the 8th Squadron and much of the capability of the 162d Squadron in a largely futile effort to discover Chinese troop dispositions. Although the photo interpreter strength of the 363d Reconnaissance Technical Squadron was augmented for this search, the photo interpreters were given no background information and were thus required to work in a vacuum A USAF evaluation stated that this "incredible mismanagement" was attributable to a lack of understanding of the capabilities and operating requirements of reconnaissance aviation.[21] More fortunate was the photographic coverage furnished the X Corps from mapping film on file at FEAF The request was for immediate delivery down

*See Chap I, pp 26–27

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to battalion level of 1:20,000 photography covering a 50 x 60-mile rectangle including Hamhung-Hungnam-Wonsan The 64th Engineer Base Topographic Battalion, to whom all mapping film was sent, began the assignment at 1400 hours on 1 December and the next night 50 copies each of 3,200 quadrangles covering the 3,000 square mile area were flown to the X Corps in Korea.[22]

Once the initial Communist attack had abated, the flood of special requests diminished, permitting more orderly reconnaissance scheduling. Coverage commitments for Army purposes nevertheless remained high. Consistent with the tactical situation, front-line block coverage with 1:10,000-scale vertical photography was flown daily and automatically delivered to Eighth Army as quickly as practicable since much of its value was for selecting artillery targets On special requests for front-line cover between 12 and 20 February 1951, block coverages were plotted and delivered to Eighth Army before 0600 hours the day following photography.[23] Beginning in June 1951, the 67th Wing also undertook to furnish Army corps and Air Force tactical wings with a complete basic photographic coverage of the area lying up to 100 miles beyond friendly artillery range.[24] Visual area search and the spotting of long-range artillery fire by the RF–51's was of primary interest to Eighth Army units. The 45th Squadron utilized single RF–51's and after April 1951 flights of two RF–51's to cover sectors of responsibility extending 15 to 20 miles north of each corps These aircraft reported sightings to forward controllers and directed to the targets flights of jet fighters when such were airborne in the vicinity. The Hammer RF–51's thus spotted armed-reconnaissance targets in the same manner in which Mosquito aircraft located close-support targets.[25] On occasions this visual reconnaissance had important tactical significance. from 10 to 21 January 1951, 45th Squadron RF–51's concentrated forward of the U.S. X Corps and ROK III Corps, keeping close watch for enemy movements at a time during which these sections of the UN line were lightly manned.[26] In addition to these two continuing projects, Eighth Army units could request special coverage; after a division G–2 had received and screened requests from subordinate units, he passed them to the corps G–2 Air who screened them a second time and relayed a consolidated request to the JOC. The Eighth Army G–2 Air received them at the JOC and passed them to the Fifth Air Force reconnaissance officer, who had the requests incorporated in the daily frag order. If the request was of sufficient urgency, it could be telephoned directly from the JOC to the 67th Wing.[27]

Much of the reconnaissance performed for the Air Force units in Korea was also of a periodic and continuing nature. Periodic coverage was maintained for enemy airfields, main supply routes, and other military targets; as an example of this effort the 67th Wing in April was expected to cover 96 airfields—18 daily, 24 every other day, and 54 of the less important weekly.[28] Day and night surveillance of railway and highway main supply routes was usually continuous.[29] Vital for the evaluation of air strikes was bomb damage assessment (BDA) photography; because of the enemy's recuperability, such photography lost its value if delayed as much as three days after a target had been attacked.[30] Against pre-briefed targets the BDA procedures in effect in Fifth Air Force was as follows: 1) a target was recommended to Operations, 2) the target was incorporated in the daily frag order; 3) the 67th Group photographed the target shortly after the strike, or, if too late in the day, the following day; 4) the 67th Reconnaissance Technical Squadron delivered three sets of pre-strike and three sets of annotated post-strike photography to Fifth Air Force Intelligence; 5) if more than 72 hours elapsed before BDA photography could be flown, such effort was canceled.[31] Pending notification of the actual strike, the 67th Group listed all pre-briefed targets in the Fifth Air Force frag order as assigned targets for expeditious BDA photography; since this frag order arrived in the evening, the photo squadrons and the technical squadron had advanced notice of an ordered strike and were able to set BDA plans in motion, the missions being flown when Fifth Air Force Operations sig-

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naled that the strike had taken place.[32] Beginning in June 1951, the 67th Wing also handled all mission planning and BDA photography north of Pyongyang required by Bomber Command in three established priorities: 1) BCA—damage assessment with priority handling, the results being called to the JOC as soon as possible and photography being readied for a Bomber Command courier by 0400 hours each morning; 2) BC—recurring coverage for Bomber Command, handled as a second priority; 3) BCP—planning photography delivered when reports were completed No annotation of photography was necessary since Bomber Command possessed its own interpretation section.[33] Special requests for photographic coverage of targets required by air units followed normal channels through the JOC and were incorporated in the daily Fifth Air Force frag order, or handled expeditiously by telephone.

As is usually the case when several headquarters depend upon a single agency for the performance of important functions, there were complaints of neglect. Thus there were reports that the Eighth Army "has not been able to obtain adequate intelligence from aerial sources since the start of the Korean war" Such reports engendered a Joint Army-Air Force team sent to Korea by the Department of Army's G–3. Summarized findings of this team, made on 26 June 1951, noted that battalions and regiments had a great need for aerial photography as map substitutes but seldom received automatic distribution of available photo coverage. Front-line cover to a depth of 10,000 yards opposite the Eighth Army was needed daily, weather permitting, but was not being flown because the Army photo interpreters could not perform even immediate interpretation on it. All three corps headquarters were said to be "extremely dissatisfied with the photographic support they were receiving." Divisions noted that the average time required to receive prints after a photographic request was submitted was four days, and in a fluid situation photography was rapidly outdated: one division G–2 stated that "the last photography I received was on June 4th, which I requested June 1st and covered an area that we overran June 3d." Since a division received only three sets of prints, regimental or battalion commanders interviewed had received no photography in the preceding three months. The regimental and battalion commanders were particularly interested in basic and front-line coverage for briefing patrols and use as map supplements, but they had failed to request such photography either because they had never had access to a basic cover overlay, did not know that capability existed within the theater for flying such photography, or had so often been unsuccessful in securing photography that they had decided it was absurd even to request it. Although the team determined that in no more than a very few instances was Army-requested photography not flown on the same day that the request reached the tactical reconnaissance squadron, it believed that "special photographic requests . . . were given no greater attention than were requests for front line cover and in many cases had lost their identity as 'special' by the time they reached the JOC." Army requests thus "invariably . . . were a third or fourth priority by the time they reached the squadron." [34]

No small amount of misapprehension on lower army unit levels arose from an Eighth Army letter of 20 May 1951 which erroneously stated 67th Wing photo capability at approximately 25 sorties per day, of which 15 to 20 sorties were required to support aerial operations, leaving only 5 to 10 sorties available to meet all Eighth Army requests. This letter was not coordinated with the 67th Wing, which for the previous three months had averaged 30 to 40 photographic sorties per day.[35] In May, moreover, 64 per cent of the photo sorties were at Air Force request and 36 per cent at Eighth Army request.[36] As a matter of fact, the reconnaissance units assigned, even though not sufficient to satisfy reconnaissance needs in the theater, could supply more photographs than could be reproduced in mass, interpreted, and distributed For the six months prior to November 1951 the RF–80's of the 15th Tactical Reconnaissance Squadron averaged only 0.643 sorties per aircraft possessed per day, or 54.96 per

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cent of a reasonable planning factor of 1.17 sorties per day: more sorties were not flown because reproduction, interpretation, and distribution could not keep up with any greater amount of photography.[37]

Deficiencies in the reconnaissance technical process affected both Fifth Air Force and Eighth Army. In World War II the AAF had handled mass production of photographic prints required by the Army, but in 1946 it was realized that this imposed too great a burden upon a reconnaissance technical squadron, especially since the Army stated that it might require as many as 50,000 prints daily to support a field army engaged in heavy operations. War Department FM 31–35, *Air-Ground Operations,* August 1946 had therefore contemplated an Army Photo Interpretation Center (APIC) to be located at an appropriate air base and to be responsible for production and dissemination of photographic intelligence, aerial photography, and its by-products required by a field army.[38] The Joint Training Directive for Air-Ground Operations, 1 September 1950, contemplated a Joint Air Photo Center, comprising on the air side a reconnaissance technical squadron and on the ground side an engineer photo reproduction and distribution organization and Army photo interpreter teams. Once the reconnaissance technical squadron had developed and printed five prints of each negative on photography requested by the Army, it was expected that Army photo interpreter teams would provide second- and third-phase interpretation and that the engineer organization would reproduce the desired quantity of photographs and make delivery to ground units.[39]

While cognizant of its responsibilities, the Eighth Army was unable to provide personnel for a joint photo center before February 1951, and then only in small numbers. Until that time the reconnaissance technical squadron had provided the necessary number of prints which were flown by courier to Eighth Army but only a limited amount of interpretation could be given to such photography. On 20 February 1951 the Eighth Army Photo Interpretation Detachment (APID) joined the reconnaissance technical squadron where it was integrated with USAF photo interpreters, although with the understanding that it would handle army photography. In March the 8199th Engineer Photo Reproduction Detachment was formed at Taegu; and beginnings could be made on a joint photo center. Early in the month laboratory personnel of the three tactical reconnaissance squadrons formed AF Photo Lab. No. 1, which processed film and made two contact prints. Manned by personnel of the 67th Reconnaissance Technical Squadron and 8199th Detachment, AF Photo Lab. No. 2 handled mass production of prints required by Fifth Air Force and Eighth Army. By 25 May the Army personnel were sufficiently trained to open the Army Photo Lab, but since the 8199th Detachment had personnel sufficient only for an eight-hour shift, much mass production for the Eighth Army had to be done in AF Photo Lab. No. 2.[40] A functional chart of the joint photo center is shown in figure 17.

Due to the limited number of Army personnel assigned to the photo center, Fifth Air Force technicians continued to reproduce prints for Eighth Army. The burden of this work conducted in addition to normal Fifth Air Force requirements meant that the undermanned photo center lacked the ability to provide the great number of photographic prints required for distribution to lower echelons of Eighth Army. Nor could the Army personnel exploit the capabilities of the 67th Wing: the F–80 squadron of this wing had the ability to fly the desirable daily frontline coverage for Eighth Army, but it did not do so because the APID could not perform even immediate interpretation on such an amount of film.[41] In July and again in November 1951 Eighth Army urgently requested the assignment of an engineer aerial photo reproduction company, but the Department of Army professed inability to dispatch such a company. In January 1951, General Van Fleet offered to take a reproduction company even with shortages of equipment and limited equipment, but the 98th Engineer Aerial Photo Reproduction Company would not reach the Far East until June 1952. Utilizing this ex-

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SECRET

FUNCTIONING OF

JOINT PHOTO CENTER

MARCH 1951

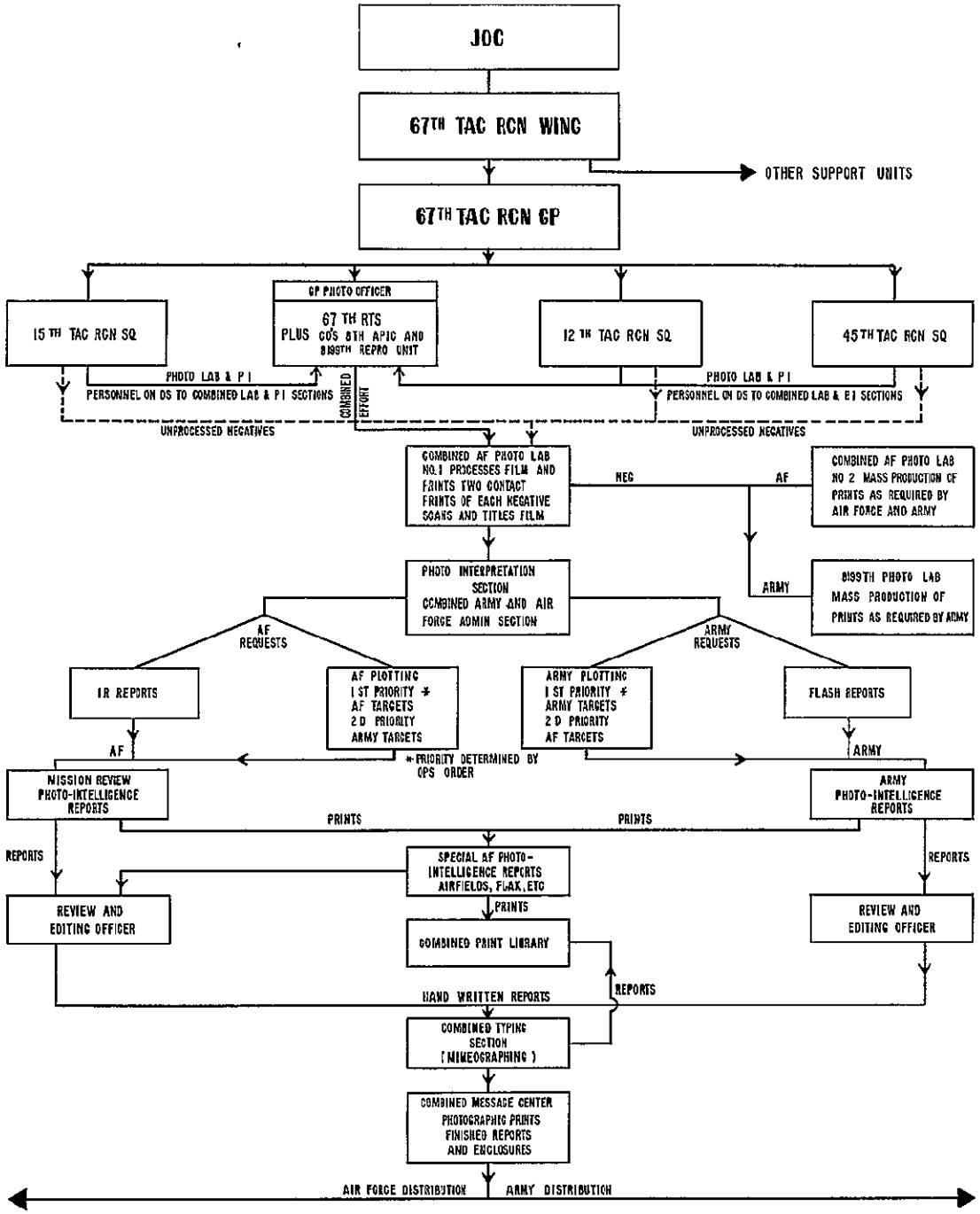


Figure 17

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panded reproduction capacity, Eighth Army would then desire daily front-line cover to a depth of 15 miles at a scale of 1:7,000, and to secure additional intelligence coverage it would expand its negative requirement from 1,229 daily to 3,600 and its print output from 5,000 to 15,000 a day.[42]

Apparently the difficulties encountered by ground units in requesting aerial photography, like its difficulties in production, arose from the inability of Eighth Army to furnish the necessary mechanism stipulated for the purpose in accepted doctrine. The Joint Training Directive for Air-Ground Operations laid a requirement on the Army for an information net, with the net control station at the JOC and stations at each corps and with the ground liaison officer for the tactical air reconnaissance wing of the tactical air force. The net was designed for the passing of requests for reconnaissance and for rapid interchange of information and intelligence.[43] It was the opinion of the USAF Tactical Air Command that activation of this information net by Eighth Army would eliminate delays in passing requests and transmitting vital intelligence.[44]

Two unrelated but equally grave factors affected the productive capacity of the 67th Reconnaissance Technical Squadron The more mundane of these was a shortage of water at Kimpo during the fall of 1951. The Kimpo site for the 67th Wing, largest and least mobile of the Fifth Air Force tactical wings, was selected because of a requirement for quick delivery of prints to the headquarters of Fifth Air Force and Eighth Army in Seoul. For this reason, construction of reconnaissance base facilities at Kimpo, the most advanced UN airfield, had begun in April 1951 and had required seven months to build. In August the 67th Wing moved forward from the acceptable reconnaissance facilities at Taegu which it had occupied for some months. In the opinion of General Ferguson the movement was of doubtful wisdom in that it concentrated the large, relatively immobile, and vulnerable (photo reproduction equipment, cameras, and reconnaissance aircraft were scarce) wing on the most advanced airfield; he further asserted that with the use of couriers and helicopters print delivery to Seoul from Taegu could have been managed with about 30 minutes more time delay than that normally encountered by the jeep courier from Kimpo to Seoul.[45] If this movement was doubtful from tactical considerations, it was also premature from the standpoint of one facility essential to photographic work: Kimpo could not furnish the approximately 50,000 gallons of fairly clear water which a reconnaissance technical squadron requires daily. Electrical services were also initially deficient. Believing that it would be able to get into its laboratory building in about two weeks, the photo lab set up shop in six squad tents for limited field operations. Not until 25 November 1951 was the photo lab able to get into its building; meanwhile, it had maintained a commendable production rate in the crowded squad tents. Although the construction of emergency water tanks and pumps ameliorated the situation somewhat, water stoppages and periods of low pressure continued to curtail photo production as late as June 1952.[46]

Of far more significance than materiel failures, and in fact the weakest link in the reconnaissance production line from the very beginning of Korean hostilities, was the critical scarcity of trained USAF photo interpreters.* Some augmentation of such personnel came from USAF, and General Stratemeyer's personal request to Marshal of the RAF Sir John C. Slessor [47] yielded a few RAF and RCAF officers, but FEAF still possessed only 44 per cent of its authorized officer and 74 per cent of its authorized airman strength in photo interpreter categories at the end of 1951 Throughout the year there was an even greater scarcity of these people in the 67th Reconnaissance Technical Squadron.[48] In a full-strength interpretation section functional and geographical specialization was an accepted advantage in World War II, but the number of technicians available to the 67th Squadron was too small to permit more than a minimum of specialization. Again, how-

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ever, even this minimum specialization paid large dividends: when RAF interpreters were assigned, three of them and two USAF officers formed a vehicle and supply team which, each officer studying a given area intently, turned up hundreds of vehicle and supply targets that otherwise would have remained unseen on photographic cover. As the situation was described in mid-November 1951, the 67th Squadron's interpretation section was hard pressed to provide minimum services: with only 33 of 84 authorized officer and airmen interpreters assigned, the section handled a daily average of 10 day-photo and 4 night-photo missions, preparing therefrom 14 immediate and 14 mission-review photo intelligence reports. In addition, the interpreters reviewed a daily average of 11 photographic missions flown primarily for the ground forces, listing air targets in a mission-review photo interpretation covering each mission. The section also prepared a daily average of two special flak, vehicle, supply, and airfield reports and annotated approximately 16 BDA prints. It issued annotated briefing prints and basic cover overlays. Such a normal amount of work taxed the section, and during periods of good flying weather, when the tactical reconnaissance squadrons doubled their sorties, little more than immediate photo-intelligence reports could be accomplished, mission-review and summary reports having to be delayed until a rainy day grounded the reconnaissance aircraft.[49] The below-strength interpretation section was not only unable to handle the full photo capability of the 67th Wing, but it was able to extract no more than 20 per cent of the available information contained in the photographs it examined.[50]

Critical during 1951, the scarcity of photo interpreters in the 67th Reconnaissance Technical Squadron threatened to become disastrous in January 1952: with only 27 interpreters available on 5 January, rotation of 8 USAF and all RAF personnel would reduce the number to 14 on 15 January. "The shortage of photo interpreters in the 67th Technical Squadron," warned the 67th Wing commander, "is becoming so critical that the intelligence information needed by United Nations Forces cannot be furnished unless something is done about the situation immediately." [51] Only through emergency action was the crisis weathered: all rest and recreation leaves were canceled during the month for photo interpreters, seven soldiers who had just completed a four-week course in photo interpretation were borrowed from the APID, and 17 officer interpreters were airlifted to Kimpo from the United States.[52] At the end of January, moreover, FEAF entered a quota of airmen at the four-week course for photo interpreters being run by the Army at Camp Palmer in Japan; most of the first graduates reached the 67th Squadron in March where they were placed in on-the-job training under experienced officers. Though having acquired only a rudimentary knowledge, the airmen were described as "generally above average in intelligence and interested in their new duties." [53] With small augmentations of officer and airmen interpreters each month, the 67th Squadron in May and June turned out 1,421 immediate and 2,325 mission-review intelligence reports. Some specialization was permitted, the flak and vehicle and supply teams proving their worth.[54] By June 1952 the process of photographic interpretation, like that of production, was approaching steady footing.

During 1951 the tactical reconnaissance squadrons possessed the capability for a greater number of sorties than could be handled by reconnaissance technical facilities, but the three squadrons nevertheless met operational problems, the chief of which was the mounting enemy opposition. The wheel horse of the tactical reconnaissance wing was the 15th Squadron, whose RF–80's covered most photo targets. Deficiencies of these planes, however, were two. they lacked sufficient range and endurance for deep penetrations, particularly at low altitudes, and they had a marked speed inferiority to the Red MIG–15's. The 15th Squadron conceded that, had the MIG's been properly employed, they could virtually have prohibited the completion of its mission, but in the localized peninsular war-

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fare in Korea RF–80 pilots utilized the slower speed and greater maneuverability of their aircraft to escape MIG interceptions.[55] Usually, however, escaping a MIG also meant aborting a photo mission. In the spring of 1951 single RF–80 sorties were employed, the idea being that one aircraft had the best chance of escaping detection and evading the enemy. Soon, however, a wingman was added for long-range missions or whenever enemy interception was probable.[56] In August, moreover, enemy air opposition had become a sufficient threat to demand fighter escort for all reconnaissance missions anywhere north and west of Sinanju. The reconnaissance missions were normally scheduled during a 4th Wing Sabre sweep, but a costly escort of 12 to 16 F–86's was nevertheless required and even with such company, MIG activity was frequently sufficient to force the flying of a reconnaissance mission 5 or 6 times before it got proper photo coverage.[57]

Recognizing the limitations of the RF–80's, USAF planned to replace them with RF–84F's in 1953, but as an interim measure it approved FEAF's proposition to modify six F–86A aircraft for photo reconnaissance.[58] As it began modifying a pilot-model Sabre in October 1951, FEAMCOM was troubled by the space limitations of the F–86 for mounting cameras. All guns were removed and 2 K–24 cameras with 6-inch cones were mounted in the radio and ammunition expenditure compartments; in test missions, flown against Namsi and Taechon airfields on 8 December 1951, demonstrated that this camera installation was unsatisfactory. to get a scale of 1:10,000 and 60 per cent overlap for stereographic viewing, the RF–86 had to fly at a hazardous 6,000 feet and slow down to 250 to 300 miles per hour.[59] The only other possibility was to mount larger aerial cameras parallel to the longitudinal axis of the aircraft and utilize mirrors to secure vertical coverage.[60] After experiment with several cameras so mounted, the K–22 36-inch camera appeared most useful as a vertical camera but all mirror vibrations blurred photography. Some improvement came when the mirrors were mounted directly on the camera, thus keeping vibration of mirror and lens synchronized.[61] Mounting nose oblique cameras posed no especial difficulty; either K–22 24-inch or 36-inch cameras could be used in the F–86's nose for oblique work, the latter being favored. Tactical tests showed that the Sabre reconnaissance aircraft would handle itself against MIG interceptors; Sabre escort for the RF–86 was also simplified by the similar flying characteristic of the reconnaissance and fighter aircraft. When used for dicing, the RF–86 proved easier to maneuver close to the ground than the RF–80, and its superior speed was a distinct advantage when encountering ground fire.[62] In June 1952, with six RF–86's assigned, the 67th Wing stated that it did not consider the Sabre to be a good photographic plane but that it did permit reconnaissance in MIG Alley.[63]

Used principally for close-in visual reconnaissance, artillery adjustment, route reconnaissance, and front-line tactical photography, the RF–51's of the 45th Tactical Reconnaissance Squadron infrequently encountered MIG's but were daily exposed to destruction and damage by Communist ground fire. Getting into action late in December 1950, the RF–51's were employed in single-plane visual reconnaissance missions at low altitudes. Operating on a "shoestring" with few planes and fewer trained pilots, the squadron was also hit hard by enemy-inflicted destruction of three RF–51's and a high incidence of combat damage in March 1951: the squadron commander thereupon directed his pilots to fly their missions at least 1,500 feet above the terrain, admittedly too high for good visual reconnaissance but desirable to curtail damage from small-arms fire.[64] Effective on 12 April, the squadron began dispatching two-ship flights on scheduled missions whenever possible, the pilots preferring to fly two dual missions a day to flying one alone.[65] Apparently the altitude restriction was subsequently relaxed when the squadron received reinforcements of planes and pilots; by August, when the squadron moved to Kimpo (K–14) airfield, the policy was stated that flights would remain over enemy lines for an

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ır and 30 minutes, the time being figured
the maximum possible before pilot fatigue,
flights from tree-top level to 4,000 feet with
nstant evasive action, became dangerous.[66]
February 1952, however, after five RF-
ere lost to enemy ground fire, minim
ade for a 45th Squadron formatio
000 feet, with the wingman fl
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o permit himself
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course.[67]

By April 1952
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arising from the fac
creasingly obsolescent
aircraft strength was
both from natural attri
while replacements were s
The 15th Squadron had 27 h
due for disassembly, inspect
(DIR) and only 15 replacemen
pected before the squadron was
equipment with F-84F's. The 45t
had 23 RF-51's; some replacements
gin to arrive in 6 to 10 months, but th
no plan to reequip the squadron with
modern aircraft. FEAF was willing tha
15th Squadron carry the RF-86A's as ov
strength but could not offer a T/O&E augmen
tation for them. As Fifth Air Force and 67th
Wing planners viewed the problem, the solu-
tion lay in beginning an eventual conversion
of the 45th Squadron to RF-80 aircraft and
the interim employment of some F-80 and
F-51 aircraft in lieu of their reconnaissance
types. The plan involved some uncertainty
as to how satisfactorily a jet fighter-type could
perform visual reconnaissance, but in May
1952 Fifth Air Force set the composition of the
45th Squadron at 5 RF-80's, 5 F-80C's, and
20 RF-51's. In June this strength was af-
fected and results of utilizing an F-80 and
RF-80 flight combination for visual recon-
naissance with photo verification were judged
excellent. Compared with the F-51, the F-80
was less vulnerable to ground fire, had excel-
lent visibility, and its flight characteristics

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to calculate aircraft utilization rates and varied in relative importance according to aircraft type: controlling factor for C–119's being usually supply of parts, for C–46's maintenance personnel, and for C–47's and C–54's the number of crews. Air routes to be flown and airfield limitations could preclude or permit utilization of full aircraft capability: thus a C–54 with a daily capability of seven flying hours would lose efficiency if the route flown was, for example, two hours each way. The final stage of the calculation was to convert the flying hours to be applied over specific routes in terms of aircraft payload and resultant tonnages of capability.[85]

When the request for air transportation was completed, it was passed to Transport Movement Control (TMC) of the 315th Air Division, each day's requirements generally being submitted before 1400 hours. At that time representatives of the 315th's Traffic Section and TMC met to prepare an operations order for the following day's airlift. Every effort was made to gain maximum utilization of each aircraft available. Aircraft carrying cargo into Korea were scheduled to return with air evacuees, cargo, or passengers. While the operations order was being cut, the transport wings were notified by telephone of their next day's commitments, which would be confirmed by the published order delivered by air courier. The Transport Movement Control also maintained constant check on aircraft flights, and through its telephone, teletype, and radio communications, it could issue new instructions to an aircraft in flight. If necessary, the aircraft could be diverted from its original destination, or if additional cargo was available, appropriate instructions would be given, preventing an aircraft from returning to Japan empty. In the event that weather or some other uncontrollable factor disrupted planned operations, the Transport Movement Control duty officer could change the operations scheduled, with information to interested parties In case of disruption to schedule, JALCO was queried as to which cargo en route would carry the highest priority.[86]

Instituted by the FEAF Combat Cargo Command and continued by the 315th Air Division, these procedures allowed efficient control of air transport, but one essential step in the process was initially lacking: because of the pattern previously established in the Berlin airlift and later in exercise SWARMER, aerial ports were an Army responsibility. By theater directive the Japan Logistics Command and Eighth Army were responsible for receiving, manifesting, loading, lashing, off-loading, and delivery of aerial cargo. Although responsible for air transportation in the Far East Command, General Tunner pointed out that he could hardly guarantee any certain airlift capability so long as he had no control over the ground handling organizations at such major ports as Ashiya, Brady, and Tachikawa. He recommended that the Air Force organize so as to handle all air terminal activities both in the Far East and on a worldwide basis.[87] General Stratemeyer agreed and on 29 November 1950 USAF permitted him to approach the Far East Command with the proposition that Combat Cargo Command would operate the aerial ports in that theater, terminating its responsibility, however, at the air freight docks.[88] On 14 January 1951, the Far East Command directed FEAF to assume responsibility for aerial ports in Japan and Korea to include manifesting, loading and lashing, unloading, and delivery to consignee.[89] The 6127th Air Terminal Group (P) was therefore organized on 7 February 1951 with the responsibility of increasing the effective utilization of FEAF airlift through prompt and proper loading and off-loading of aircraft; although penalized somewhat to begin with by many personnel misfits and a general shortage of cargo-handling equipment, the group completed the transfer of responsibilities when it took over at Ashiya and Brady on 31 March 1951. Originally established with 10 detachments, the group expanded to 13 to handle its largest workload in June 1951: in this month detachments loaded 10,938 aircraft sorties with a cargo comprising 60,475 passengers, 17,146 tons of cargo, 899 tons of mail, and 10,520 air evacuation

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patients. Most of the grand total of 25,480 tons was later off-loaded at its destination by other 6127th detachments. In addition to a table of distribution strength of 107 officers and 762 airmen, the group hired some 2,000 indigenous Japanese and Korean laborers. At the Korean end of the airlift the detachments were moved about to the airfields where they were needed; through rapid loading and unloading they permitted fast turnarounds, increasing the utilization of transport aircraft and reducing aircraft congestion where airfield facilities were limited.[90] Practicability of the activity having been amply demonstrated in the Far East, the Joint Chiefs of Staff ordered on 5 December 1951 that the establishment and operation of air transport terminal facilities to be used in handling personnel and cargoes moved by organic aircraft of any service would be the responsibility of that service.[91]

Of vital importance to UN ground forces in Korea during the spring of 1951, when weather turned the tortuous roads into streams of mud, were airdropped supplies Almost every UN front-line unit at one time or another required "supply from the sky," and the system sustained in combat at the Choshin Reservoir area a unit of greater than division size for 13 days during November and December 1950. Under the control procedures effected for airdrops, front-line units could receive supplies from Japan within six to eight hours. Requests for supply drops were made through definitely established channels, using procedures designed to expedite consummation of the desired mission. The troop unit desiring a drop communicated with Eighth Army's G–4 air transportation officer, who passed essential information to JALCO and to the 315th liaison officer at Eighth Army. The 315th liaison officer made the necessary arrangements with Fifth Air Force, occasionally requesting fighter cover, and telephoned or radioed all necessary information to the 315th Operations Plans Section, the unit responsible for handling all such requests. Meanwhile, JALCO checked with the 2348th QM Airborne Air Supply and Packaging Company at Ashiya to determine what required supplies were now on hand and how soon loading could begin Operations Plans at the 315th was then given precise information on supplies to be dropped, their weight, and the time loading could begin At the 315th, decision was made as to which unit would fly the mission, a decision which depended upon the degree of urgency and the location of the drop zone. The 314th Troop Carrier Group's C–119's based at Ashiya were used when time was short, if the drop target was likely to be hazarded by enemy fire, or if it was circumscribed by terrain. When there was time enough, 437th Wing C–46's could be brought to Ashiya from Brady, but they could be used only with calculated risk if the drop zone was hazardous because they would have to make several passes to discharge their cargo. Complete information was passed by telephone to the troop carrier group selected for the mission and confirmed by a frag operations order. The group then made the necessary planes available to the 2348th Company which loaded them and provided the trained "kickers" who ejected the cargo over the drop zone.[92]

By all accounts the 2348th QM Airborne Air Supply and Packaging Company did an excellent job of packaging and loading, but its status in the process limited the authority of the 315th Air Division in the exercise of its responsibility for supply dropping. The company had been hastily activated at Fort Campbell, Kentucky, on 31 July 1950 and dispatched to Japan with the 187th Regimental Combat Team, where at Ashiya it was placed on detached service with FEAF Combat Cargo Command.[93] During 1951 the company was redesigned as the 8081st Army Unit and placed under control of the 8247th Army Unit, the latter being the logistical organization responsible for handling depot supplies at the Ashiya terminal The 8081st was manned and equipped to pack and load 215 tons a day, the capacity representing a potential restriction to the 315th Air Division which had a drop capability of 450 tons daily.[94] With the organization of the 6127th Air Terminal

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Group, which maintained detachments side by side with 8081st at Ashiya, the duplication of effort was wasteful of manpower: when a portion of the airlift was utilized for para-dropped cargo, the work load upon the air terminal group was correspondingly reduced and its manpower rendered idle. Conversely, when the 6127th worked at full capacity with the airlift, the 8081st had slack periods, although it generally devoted the time to pre-packaging supplies for future requirements On 29 June 1951, General Henebry therefore requested FEAF to secure authority and responsibility for airdropped resupply packaging, loading, and discharge. Not only would the change save some manpower, but it would prove beneficial to an orderly control of future large-scale airdropped supply efforts. While no USAF authority for the transfer of functions was forthcoming, the 315th Air Division maintained its conviction that "the scope of Air Force responsibility [must] include the parachute preparation, and packaging of supplies, as well as the loading and 'kicking' operations for air resupply drops. This responsibility can be accomplished by a properly manned and equipped air terminal organization operating in conjunction with the present wing and group organization." [95]

Although the concept of supplying military units by parachute drop was not new, the Korean campaign, with its peculiar logistics problems, required the greatest airdrop resupply operations in history Successful perfection of drop techniques, moreover, allowed the 315th Air Division to assert that: "Air drops have replaced the glider We drop anything by parachute that can be loaded into a glider . . with less . . . loss of life and equipment." [96] In the C–119 the 315th Air Division possessed an aircraft admirably suited for supply drops: it was able to get in and out of a drop zone quickly, dumping its load in a single pass, thus minimizing exposure to enemy action and scattering of supplies To facilitate loading and dropping, the C–119's were flown with clam-shell doors removed while rollers mounted in the floor of the cargo compartment facilitated handling of supplies packaged and mounted on four-by-four-foot plywood pallets. In loading, men working in teams used forklifts to raise the loaded pallets to 6 x 6 trucks which, in turn, were backed up to the open end of the C–119's, where the pallets were shifted onto the rollerized fuselage bed. Static lines of cargo parachutes attached to each bundle were hooked to anchor lines and the entire load was doubly secured by steel cables and nylon web straps. When the C–119 was 20 minutes from the drop zone, the "kickers" removed the steel cables, allowing the load to settle into the nylon straps. At the proper point, marked by the pilot's bell signal, the "kickers" pulled a release cable which permitted the entire load to leave the aircraft in three and one-half seconds. The plywood pallets broke away in the slip stream, permitting the cargo parachutes to open without encumbrance Occasionally, drops of unbreakable items, such as clothing and wire, were accomplished by free fall from any type of aircraft [97] The employment of palletized supplies not only facilitated handling but permitted the accumulation of standardized units in anticipation of requirements.

As the 315th Air Division was free to admit, airdrops were not always "a big, howling success." A 10 per cent loss of airdropped supplies was assumed in advance and a correspondingly greater tonnage was dropped than was required on the ground. Actually, the 315th calculated that losses were generally less than 3 per cent. The C–119 drop system held two endemic defects· the unloading of 45 to 65 parachutes in 3 to 6 seconds caused momentary saturation of the air and full opening was slowed until the parachutes became separated. Streaming parachutes which did not open caused the loss of the bundle by excessive impact. A practice of some pilots who raised the nose of their aircraft and applied power at the release was found to cause a high incidence of streamers. The jamming of cargo before or during a drop was a second defect to the C–119 system, it could be caused by the pallets shifting or the bundles shifting on the pallets due to improper loading or turbulent air Occasionally, static lines tangled in the

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rollers or the cargo release malfunctioned. A major contributing factor to these defects lay in the size of the package. The packaging company generally preferred to use 200- to 300-pound bundles, which were easier to handle on the ground, could be used as a door bundle in C–46 or C–47 aircraft, and could be prepackaged in quantity some time in advance of a drop requirement. The failure of a single parachute, moreover, would result in a small loss of supplies. On the other hand, pallet loads of 1,500- to 2,000-pound bundles presented favorable considerations: fewer but larger parachutes were required, reducing fouling and tangling; recovery on the ground was simplified by fewer packages; and cargo jamming or shifting was less likely When there was a long drop zone, the loading company could "double section" the cargo, permitting the "kicker" to release half of the load on the "go" signal, then count two and release the remainder. The 120-yard spacing between sections materially reduced the incidence of streamers and broken bundles [98]

By far the greatest qualifying factor to the success of an airdrop mission, however, lay in the nature and identification of the dropping zone selected by the ground unit needing supply. Successful launching of parachute supplies demanded that a C–119 cross the drop zone at 800 feet altitude and at a near-stalling speed of 120 m.p.h. Under such conditions of flight in the mountainous terrain of Korea, almost any supply drop was a tortuous and hazardous proceeding, often additionally complicated by the failure of the ground troops to recognize air needs for adequate drop zones and suitably to mark them with the "T" panels used for the purpose. "They had the DZ down in the corner of a box canyon that even a snake couldn't get into," complained one pilot; while another added· "The 'T' was so small we needed a microscope to find it." Ordinarily, the transport planes could expect assistance from the Mosquito airborne controller operating in the area, but the controllers frequently were vague about the location of scheduled drop zones: on 3 June 1951 a confused Mosquito controller led a C–119 formation into an artillery barrage, resulting in the destruction of two of the cargo planes.[99] From the 315th Air Division point of view, an acceptable drop zone was at least 500 yards long, a minimum of 200 yards wide, as level as possible, and surfaced with sod or turf which would give some cushion to the falling bundles. As a pilot was usually forced to maintain 4,000 to 5,000 feet of altitude in order to locate a drop-zone marker in the mountainous terrain, he needed 14 miles of clear-approach path to let down and at least three miles of straight-in approach in which to reduce his speed to 120 miles per hour, estimate surface winds, and line up on the "T" marker. To recover from the drop and regain speed the transport pilot needed six or seven miles of exit, but he could make gentle turns provided at least two miles of air space was available Since there were "no built-in fox holes in a cargo aircraft," the 315th Air Division desired notification of any hostile weapons emplacements adjacent to the drop zone so that they might be neutralized by a preliminary fighter strike.[100]

Given the selection of an acceptable drop zone, nothing was more important to the success of a supply drop than its proper marking for clear and definite identification from 5,000 feet. Despite the existence of standing procedures, drop-zone marking was one of the worst problems in the Korean aerial resupply operation Most of the C–119's were equipped with the Rebecca component of the Rebecca-Eureka radar system, but because only airborne units possessed the Eureka ground component, the system was impracticable in Korea despite the fact that there was a great need for it or some similar radar control [101] Lacking electronics, the approved method of marking drop zones was with a "T" of eight 3 x 15 foot fabric panels; when several drops had to be made in the same area, the proper procedure required the use of additional panels to form some other code symbol near the "T." This symbol, plus the color of the "T," became the identification for the drop mission A smoke grenade or smudge fire was an additional identification which greatly assisted the transports. In addition to these standard designators, ground troops showed

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fare in Korea RF–80 pilots utilized the slower speed and greater maneuverability of their aircraft to escape MIG interceptions.[55] Usually, however, escaping a MIG also meant aborting a photo mission. In the spring of 1951 single RF–80 sorties were employed, the idea being that one aircraft had the best chance of escaping detection and evading the enemy. Soon, however, a wingman was added for long-range missions or whenever enemy interception was probable.[56] In August, moreover, enemy air opposition had become a sufficient threat to demand fighter escort for all reconnaissance missions anywhere north and west of Sinanju. The reconnaissance missions were normally scheduled during a 4th Wing Sabre sweep, but a costly escort of 12 to 16 F–86's was nevertheless required and even with such company, MIG activity was frequently sufficient to force the flying of a reconnaissance mission 5 or 6 times before it got proper photo coverage.[57]

Recognizing the limitations of the RF–80's, USAF planned to replace them with RF–84F's in 1953, but as an interim measure it approved FEAF's proposition to modify six F–86A aircraft for photo reconnaissance.[58] As it began modifying a pilot-model Sabre in October 1951, FEAMCOM was troubled by the space limitations of the F–86 for mounting cameras. All guns were removed and 2 K–24 cameras with 6-inch cones were mounted in the radio and ammunition expenditure compartments; initial test missions, flown against Namsi and Taechon airfields on 8 December 1951, demonstrated that this camera installation was unsatisfactory: to get a scale of 1:10,000 and 60 per cent overlap for stereographic viewing, the RF–86 had to fly at a hazardous 6,000 feet and slow down to 250 to 300 miles per hour.[59] The only other possibility was to mount larger aerial cameras parallel to the longitudinal axis of the aircraft and utilize mirrors to secure vertical coverage.[60] After experiment with several cameras so mounted, the K–22 36-inch camera appeared most useful as a vertical camera but all mirror vibrations blurred photography. Some improvement came when the mirrors were mounted directly on the camera, thus keeping vibration of mirror and lens synchronized.[61] Mounting of nose oblique cameras posed no especial difficulty; either K–22 24-inch or 36-inch cameras could be used in the F–86's nose for oblique work, the latter being favored. Tactical tests showed that the Sabre reconnaissance aircraft would handle itself against MIG interceptors, Sabre escort for the RF–86 was also simplified by the similar flying characteristic of the reconnaissance and fighter aircraft. When used for dicing, the RF–86 proved easier to maneuver close to the ground than the RF–80, and its superior speed was a distinct advantage when encountering ground fire.[62] In June 1952, with six RF–86's assigned, the 67th Wing stated that it did not consider the Sabre to be a good photographic plane but that it did permit reconnaissance in MIG Alley.[63]

Used principally for close-in visual reconnaissance, artillery adjustment, route reconnaissance, and front-line tactical photography, the RF–51's of the 45th Tactical Reconnaissance Squadron infrequently encountered MIG's but were daily exposed to destruction and damage by Communist ground fire. Getting into action late in December 1950, the RF–51's were employed in single-plane visual reconnaissance missions at low altitudes. Operating on a "shoestring" with few planes and fewer trained pilots, the squadron was also hit hard by enemy-inflicted destruction of three RF–51's and a high incidence of combat damage in March 1951: the squadron commander thereupon directed his pilots to fly their missions at least 1,500 feet above the terrain, admittedly too high for good visual reconnaissance but desirable to curtail damage from small-arms fire.[64] Effective on 12 April, the squadron began dispatching two-ship flights on scheduled missions whenever possible, the pilots preferring to fly two dual missions a day to flying one alone.[65] Apparently the altitude restriction was subsequently relaxed when the squadron received reinforcements of planes and pilots; by August, when the squadron moved to Kimpo (K–14) airfield, the policy was stated that flights would remain over enemy lines for an

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hour and 30 minutes, the time being figured as the maximum possible before pilot fatigue, in flights from tree-top level to 4,000 feet with constant evasive action, became dangerous.[66] In February 1952, however, after five RF-51's were lost to enemy ground fire, minimum altitude for a 45th Squadron formation was set at 6,000 feet, with the wingman flying some 1,000 feet higher to call out ground fire. To complicate visual tracking by enemy gunners and to permit himself greater visibility, the flight leader was expected to fly a very erratic course.[67]

By April 1952 both 67th Wing day reconnaissance squadrons had a common problem arising from the fact that they were flying increasingly obsolescent aircraft. their effective aircraft strength was decreasing monthly both from natural attrition and battle loss, while replacements were slowing to a trickle. The 15th Squadron had 27 RF-80A's, all overdue for disassembly, inspection, and repair (DIR) and only 15 replacements could be expected before the squadron was due for reequipment with F-84F's. The 45th Squadron had 23 RF-51's, some replacements would begin to arrive in 6 to 10 months, but there was no plan to reequip the squadron with more modern aircraft. FEAF was willing that the 15th Squadron carry the RF-86A's as overstrength but could not offer a T/O&E augmentation for them. As Fifth Air Force and 67th Wing planners viewed the problem, the solution lay in beginning an eventual conversion of the 45th Squadron to RF-80 aircraft and the interim employment of some F-80 and F-51 aircraft in lieu of their reconnaissance types. The plan involved some uncertainty as to how satisfactorily a jet fighter-type could perform visual reconnaissance, but in May 1952 Fifth Air Force set the composition of the 45th Squadron at 5 RF-80's, 5 F-80C's, and 20 RF-51's. In June this strength was affected and results of utilizing an F-80 and RF-80 flight combination for visual reconnaissance with photo verification were judged excellent. Compared with the F-51, the F-80 was less vulnerable to ground fire, had excellent visibility, and its flight characteristics permitted the pilot to concentrate on visual reconnaissance instead of devoting so much attention to flying the plane. The other part of this reequipment plan fixed the complement of the 15th Squadron at 22 RF-80's, 5 F-80's, and 5 RF-86's, for a total strength of 32 aircraft, including 2 of the RF-86's carried as a maintenance-acceptable overage.[68]

The night reconnaissance squadron of the 67th Wing was the 12th Tactical Reconnaissance Squadron, Night Photo, equipped with RB-26 aircraft. Because of the relatively weak state of Communist night interception, these obsolete aircraft had little to fear from the enemy; not until February 1952 did the squadron lose its first aircraft to enemy action of an unknown nature.[69] Like other B-26 units in the command, the 12th Squadron received an inadequate aircraft support which seriously impaired its effectiveness. FEAF protested in September 1951 that although authorized 27 unit-equipment plus 3 reserve RB-26's, it had never possessed more than 24 aircraft; USAF replied that while shortages of spare parts had delayed modification, FEAF would receive 4 RB-26's in December 1951 and the other 6 projected aircraft by February 1952, with normal attrition continuing thereafter.[70] The schedule was met successfully and FEAF strength rose to 33 RB-26's in January 1952.[71]

The usual night reconnaissance mission was a route surveillance averaging something over three hours in duration in the process of which photographs were taken of pre-briefed objectives. Under these circumstances, the success or failure of a night reconnaissance mission rested largely on the precision of the navigation, and in deference to this responsibility the RB-26 crew comprised a pilot and two navigators, one riding in the nose and acting as navigator-bombardier and the other operating a loran set in the rear compartment. Careful planning prior to a mission was essential: during the afternoon both navigators, taking account of forecasted winds, prepared a complete preflight log to include not only the route but also the initial points and targets, selecting prominent checkpoints

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and having care to avoid enemy antiaircraft concentrations. Once in flight, best results were achieved when both navigators plotted course simultaneously: loran fixes thereby could be constantly compared with visual checkpoints and chances for position error minimized. If pre-mission planning was correctly accomplished, the nose navigator, once in the target area, had little or no difficulty guiding the aircraft over the initial point, the flash-bomb release point, and the target itself. In route reconnaissance all sightings of movement were recorded by the nose navigator, sightings of "hot" targets such as trains, troop columns, and large numbers of vehicles were immediately relayed to predesignated TADC's or directly to night intruders for expedited attack.[72]

Since precise navigation was necessary for night photography, the 12th Squadron devoted a considerable amount of effort to a generally fruitless experimentation with shoran The 162d Squadron, which was redesignated as the 12th, had come to the Far East with theoretical shoran proficiency, and in April 1951, after much renovation of equipment, the 12th got good results from shoran-positioned night photography in the vicinity of the Eighth Army front. At a time in which haze and smoke of combat almost prohibited visual photo runs, shoran-qualified crews were able to cover more targets than those crews depending on visual or initial point approaches.[73] But because of the limited coverage of line-of-sight shoran at the 3,000- to 7,000-foot altitudes employed for night photography by the 12th Squadron, the shoran system could not be used for deep penetrations into North Korea. Because of this factor as well as the lack of trained operators and the difficulty of maintaining the airborne equipment, 12th Squadron shoran utilization had dropped off to zero by August 1951.[74] In April 1952, however, the 67th Wing was again experimenting with electronic controls, both MSQ–1 and shoran being utilized to position night-photo RB–26's. With indications that enemy flak was going to necessitate increased RB–26 altitudes, it was expected that shoran would prove workable.[75]

For its night photography the 12th Squadron RB–26's utilized K–19 and K–37 cameras apparently without difficulty, but providing dependable illumination for night photographic work was a continuing problem. While they were en route to Korea a newly developed low-altitude night photographic system utilizing flash cartridges had been installed in the planes. Under Korean field conditions the system developed faults usual to new equipment: initially M–112 flash cartridges had a high dud rate, but when more dependable cartridge lots were received, their increased dependability brought greater use with consequent malfunctions of the A–14 magazines.[76] By April 1951 the night reconnaissance squadron had practically given up use of the system because of a general breakdown of identical clutch mechanisms in the equipment.[77] Once again, however, factory technicians and FEAMCOM corrected the malfunctions, and the system was used to some extent until May 1952 when the decision to increase photo altitudes rendered it superfluous.[78] For medium level operations the night reconnaissance squadron employed M–46 photo-flash bombs, at first encountering the many duds endemic to this bomb but getting good results by fuzing it with the M–155 fuze beginning in January 1951.[79] In June 1952, preparatory to high-level operations, the squadron was experimenting with a modified K–19B camera which would be used with the more powerful M–120 flash bombs.[80]

After a slow build-up due most directly to a general neglect in the between-war years of 1946–50, tactical reconnaissance in Korea was coming to maturity in the late spring and early summer of 1952 Aided by good weather in May 1952, the 67th Wing flew 2,143 sorties to photograph 2,447 targets, of which 871 were for the Army. Of 87,239 negatives exposed in May, 84,749 photos were interpreted, and 583,385 photos printed and delivered, 193,310 to the Army and 390,075 to the Air Force.[81] All totals were the highest attained

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up to that time. Of great importance to the Fifth Air Force, which was going to attack more diversified targets beginning in July, was the augmented strength of the 67th Reconnaissance Technical Squadron which would permit it to develop significant objectives for air attack out of the voluminous quantity of photographic cover taken daily.[82]

AIR TRANSPORT

Provisionally activated on 26 August 1950, the FEAF Combat Cargo Command and its successor 315th Air Division (25 January 1951) represented the organizational concepts of their commanding officer, Maj. Gen. William H. Tunner. To develop the 315th Air Division along these and corollary concepts became the task of Brig. Gen. John P. Henebry, who took command on 8 February 1951. Basically both officers believed that when directly responsible to the theater air force and able to exercise continuous centralized control over its subordinates, a single air transport command with one fleet of aircraft could successfully carry out all of the transport-type missions—airborne assaults, airdrop resupply, air-landed resupply, air evacuation of sick and wounded, personnel transport, air movement of tactical units and special air missions, together with all of the activities allied to such operations. They considered flexibility of air transport rather than the possession of large numbers of aircraft to be the practical answer to good air transportation.[83]

Although assigned directly to FEAF, the 315th Air Division (Combat Cargo) served as the theater air transport function, and allocation of airlift capacity was at the Far East Command level. Each week the 315th computed and submitted through FEAF a capacity statement to the Far East Command theater transportation board, a body comprising representatives of Army, Navy, and Air Force, and responsible for the allocation of all airlift services in terms of tonnages to be hauled. The deliberations of the board were influenced primarily by the tactical situation, and in a period of crisis the board could conceivably allocate the entire airlift to one agency; normal weekly division of airlift capacity, however, usually gave Eighth Army approximately 50 per cent, Fifth Air Force 35 per cent, the Navy 10 per cent, and all other users 5 per cent. Located with the 315th Air Division were liaison officers of the two principal airlift users, Army and Air Force, who made up what was informally called the Joint Airlift Control (JALCO). These officers received specific requests for air movements and decided what was to be moved and its priority, keeping their consolidated requirements within the tonnages specified for their agency. If he was asked to have airlifted a total tonnage exceeding his agency's allocation, the coordination or liaison officer first approached his Army or Air Force counterpart to determine whether he could "borrow" some of that officer's allocation. Such was the case in October and November 1950 when first the Eighth Army and then the Fifth Air Force used nearly all of the airlift; in this critical circumstance, moreover, Generals Walker and Partridge personally allocated day-to-day airlift, superseding the regular JALCO procedure.[84] Where tonnage could not be borrowed, the 315th Air Division could be requested to exceed its stated capabilities; if this was to be more than one or two days, the 315th would require authority from the FEC theater transportation board.

The 315th Air Division thus was not concerned with allocation of its airlift effort nor with the designation of movement priorities: through its weekly calculations of capability, however, it laid the basis for all planning. The various factors entering into this determination of capability had to be figured for each aircraft and air route to be flown. The primary planning factors were: 1) number of crews assigned, 2) volume of replacement parts available; 3) number of maintenance personnel per assigned aircraft; 4) airway and airfield limitations; and 5) variety of routes to be flown. The first three factors were used

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to calculate aircraft utilization rates and varied in relative importance according to aircraft type· controlling factor for C–119's being usually supply of parts, for C–46's maintenance personnel, and for C–47's and C–54's the number of crews. Air routes to be flown and airfield limitations could preclude or permit utilization of full aircraft capability: thus a C–54 with a daily capability of seven flying hours would lose efficiency if the route flown was, for example, two hours each way. The final stage of the calculation was to convert the flying hours to be applied over specific routes in terms of aircraft payload and resultant tonnages of capability.[85]

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patients. Most of the grand total of 25,480 tons was later off-loaded at its destination by other 6127th detachments. In addition to a table of distribution strength of 107 officers and 762 airmen, the group hired some 2,000 indigenous Japanese and Korean laborers. At the Korean end of the airlift the detachments were moved about to the airfields where they were needed, through rapid loading and unloading they permitted fast turnarounds, increasing the utilization of transport aircraft and reducing aircraft congestion where airfield facilities were limited.[90] Practicability of the activity having been amply demonstrated in the Far East, the Joint Chiefs of Staff ordered on 5 December 1951 that the establishment and operation of air transport terminal facilities to be used in handling personnel and cargoes moved by organic aircraft of any service would be the responsibility of that service.[91]

Of vital importance to UN ground forces in Korea during the spring of 1951, when weather turned the tortuous roads into streams of mud, were airdropped supplies. Almost every UN front-line unit at one time or another required "supply from the sky," and the system sustained in combat at the Choshin Reservoir area a unit of greater than division size for 13 days during November and December 1950. Under the control procedures effected for airdrops, front-line units could receive supplies from Japan within six to eight hours Requests for supply drops were made through definitely established channels, using procedures designed to expedite consummation of the desired mission. The troop unit desiring a drop communicated with Eighth Army's G–4 air transportation officer, who passed essential information to JALCO and to the 315th liaison officer at Eighth Army. The 315th liaison officer made the necessary arrangements with Fifth Air Force, occasionally requesting fighter cover, and telephoned or radioed all necessary information to the 315th Operations Plans Section, the unit responsible for handling all such requests. Meanwhile, JALCO checked with the 2348th QM Airborne Air Supply and Packaging Company at Ashiya to determine what required supplies were now on hand and how soon loading could begin. Operations Plans at the 315th was then given precise information on supplies to be dropped, their weight, and the time loading could begin At the 315th, decision was made as to which unit would fly the mission, a decision which depended upon the degree of urgency and the location of the drop zone. The 314th Troop Carrier Group's C–119's based at Ashiya were used when time was short, if the drop target was likely to be hazarded by enemy fire, or if it was circumscribed by terrain When there was time enough, 437th Wing C–46's could be brought to Ashiya from Brady, but they could be used only with calculated risk if the drop zone was hazardous because they would have to make several passes to discharge their cargo. Complete information was passed by telephone to the troop carrier group selected for the mission and confirmed by a frag operations order. The group then made the necessary planes available to the 2348th Company which loaded them and provided the trained "kickers" who ejected the cargo over the drop zone.[92]

By all accounts the 2348th QM Airborne Air Supply and Packaging Company did an excellent job of packaging and loading, but its status in the process limited the authority of the 315th Air Division in the exercise of its responsibility for supply dropping. The company had been hastily activated at Fort Campbell, Kentucky, on 31 July 1950 and dispatched to Japan with the 187th Regimental Combat Team, where at Ashiya it was placed on detached service with FEAF Combat Cargo Command.[93] During 1951 the company was redesigned as the 8081st Army Unit and placed under control of the 8247th Army Unit, the latter being the logistical organization responsible for handling depot supplies at the Ashiya terminal. The 8081st was manned and equipped to pack and load 215 tons a day, the capacity representing a potential restriction to the 315th Air Division which had a drop capability of 450 tons daily.[94] With the organization of the 6127th Air Terminal

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Group, which maintained detachments side by side with 8081st at Ashiya, the duplication of effort was wasteful of manpower: when a portion of the airlift was utilized for para-dropped cargo, the work load upon the air terminal group was correspondingly reduced and its manpower rendered idle. Conversely, when the 6127th worked at full capacity with the airlift, the 8081st had slack periods, although it generally devoted the time to pre-packaging supplies for future requirements On 29 June 1951, General Henebry therefore requested FEAF to secure authority and responsibility for airdropped resupply packaging, loading, and discharge Not only would the change save some manpower, but it would prove beneficial to an orderly control of future large-scale airdropped supply efforts. While no USAF authority for the transfer of functions was forthcoming, the 315th Air Division maintained its conviction that "the scope of Air Force responsibility [must] include the parachute preparation, and packaging of supplies, as well as the loading and 'kicking' operations for air resupply drops This responsibility can be accomplished by a properly manned and equipped air terminal organization operating in conjunction with the present wing and group organization " [95]

Although the concept of supplying military units by parachute drop was not new, the Korean campaign, with its peculiar logistics problems, required the greatest airdrop resupply operations in history. Successful perfection of drop techniques, moreover, allowed the 315th Air Division to assert that: "Air drops have replaced the glider. We drop anything by parachute that can be loaded into a glider . with less . . loss of life and equipment." [96] In the C–119 the 315th Air Division possessed an aircraft admirably suited for supply drops. it was able to get in and out of a drop zone quickly, dumping its load in a single pass, thus minimizing exposure to enemy action and scattering of supplies To facilitate loading and dropping, the C–119's were flown with clam-shell doors removed while rollers mounted in the floor of the cargo compartment facilitated handling of supplies packaged and mounted on four-by-four-foot plywood pallets In loading, men working in teams used forklifts to raise the loaded pallets to 6 x 6 trucks which, in turn, were backed up to the open end of the C–119's, where the pallets were shifted onto the rollerized fuselage bed. Static lines of cargo parachutes attached to each bundle were hooked to anchor lines and the entire load was doubly secured by steel cables and nylon web straps When the C–119 was 20 minutes from the drop zone, the "kickers" removed the steel cables, allowing the load to settle into the nylon straps. At the proper point, marked by the pilot's bell signal, the "kickers" pulled a release cable which permitted the entire load to leave the aircraft in three and one-half seconds. The plywood pallets broke away in the slip stream, permitting the cargo parachutes to open without encumbrance Occasionally, drops of unbreakable items, such as clothing and wire, were accomplished by free fall from any type of aircraft.[97] The employment of palletized supplies not only facilitated handling but permitted the accumulation of standardized units in anticipation of requirements.

As the 315th Air Division was free to admit, airdrops were not always "a big, howling success." A 10 per cent loss of airdropped supplies was assumed in advance and a correspondingly greater tonnage was dropped than was required on the ground Actually, the 315th calculated that losses were generally less than 3 per cent. The C–119 drop system held two endemic defects: the unloading of 45 to 65 parachutes in 3 to 6 seconds caused momentary saturation of the air and full opening was slowed until the parachutes became separated. Streaming parachutes which did not open caused the loss of the bundle by excessive impact. A practice of some pilots who raised the nose of their aircraft and applied power at the release was found to cause a high incidence of streamers The jamming of cargo before or during a drop was a second defect to the C–119 system; it could be caused by the pallets shifting or the bundles shifting on the pallets due to improper loading or turbulent air. Occasionally, static lines tangled in the

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rollers or the cargo release malfunctioned. A major contributing factor to these defects lay in the size of the package. The packaging company generally preferred to use 200- to 300-pound bundles, which were easier to handle on the ground, could be used as a door bundle in C–46 or C–47 aircraft, and could be prepackaged in quantity some time in advance of a drop requirement. The failure of a single parachute, moreover, would result in a small loss of supplies. On the other hand, pallet loads of 1,500- to 2,000-pound bundles presented favorable considerations: fewer but larger parachutes were required, reducing fouling and tangling; recovery on the ground was simplified by fewer packages; and cargo jamming or shifting was less likely. When there was a long drop zone, the loading company could "double section" the cargo, permitting the "kicker" to release half of the load on the "go" signal, then count two and release the remainder. The 120-yard spacing between sections materially reduced the incidence of streamers and broken bundles.[98]

By far the greatest qualifying factor to the success of an airdrop mission, however, lay in the nature and identification of the dropping zone selected by the ground unit needing supply. Successful launching of parachute supplies demanded that a C–119 cross the drop zone at 800 feet altitude and at a near-stalling speed of 120 m.p.h. Under such conditions of flight in the mountainous terrain of Korea, almost any supply drop was a tortuous and hazardous proceeding, often additionally complicated by the failure of the ground troops to recognize air needs for adequate drop zones and suitably to mark them with the "T" panels used for the purpose. "They had the DZ down in the corner of a box canyon that even a snake couldn't get into," complained one pilot; while another added: "The 'T' was so small we needed a microscope to find it." Ordinarily, the transport planes could expect assistance from the Mosquito airborne controller operating in the area, but the controllers frequently were vague about the location of scheduled drop zones: on 3 June 1951 a confused Mosquito controller led a C–119 formation into an artillery barrage, resulting in the destruction of two of the cargo planes.[99] From the 315th Air Division point of view, an acceptable drop zone was at least 500 yards long, a minimum of 200 yards wide, as level as possible, and surfaced with sod or turf which would give some cushion to the falling bundles. As a pilot was usually forced to maintain 4,000 to 5,000 feet of altitude in order to locate a drop-zone marker in the mountainous terrain, he needed 14 miles of clear-approach path to let down and at least three miles of straight-in approach in which to reduce his speed to 120 miles per hour, estimate surface winds, and line up on the "T" marker. To recover from the drop and regain speed the transport pilot needed six or seven miles of exit, but he could make gentle turns provided at least two miles of air space was available. Since there were "no built-in fox holes in a cargo aircraft," the 315th Air Division desired notification of any hostile weapons emplacements adjacent to the drop zone so that they might be neutralized by a preliminary fighter strike.[100]

Given the selection of an acceptable drop zone, nothing was more important to the success of a supply drop than its proper marking for clear and definite identification from 5,000 feet. Despite the existence of standing procedures, drop-zone marking was one of the worst problems in the Korean aerial resupply operation. Most of the C–119's were equipped with the Rebecca component of the Rebecca-Eureka radar system, but because only airborne units possessed the Eureka ground component, the system was impracticable in Korea despite the fact that there was a great need for it or some similar radar control.[101] Lacking electronics, the approved method of marking drop zones was with a "T" of eight 3 x 15 foot fabric panels; when several drops had to be made in the same area, the proper procedure required the use of additional panels to form some other code symbol near the "T." This symbol, plus the color of the "T," became the identification for the drop mission. A smoke grenade or smudge fire was an additional identification which greatly assisted the transports. In addition to these standard designators, ground troops showed

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an alarming tendency to improvise: on 13 September 1951 one troop unit fired tracer ammunition to the front and below the transports to aid location of a drop zone—a procedure greatly disfavored by the pilots.[102] Very frequently ground units were tardy in taking up their panels with the result that many dropping symbols might be seen along the front lines, in June 1951 a 314th Group mission counted no less than five "T's" with deltas beneath (the briefed drop zone marking) within a five-mile radius of their proper destination.[103] Although night magnified terrain difficulties for airdrops, they were nevertheless made when the tactical situation demanded. The procedure was to use lights instead of panels to form the "T"; burning of motor gasoline in shallow pits or in half drums made a practical marker, but on one occasion pilots made emergency pre-dawn drops between the headlights of two jeeps.[104] Finally, as the 315th Air Division pamphlet of instruction informed the ground troops: "You may have selected the best DZ in Korea, you may have marked it like a Times Square spectacular, but it's So-o-o nice to have somebody to talk to." After the two C–119's were shot down by friendly artillery, all planned drops were prohibited if the transports failed to make radio contact with the division TACP.[105]

The many difficulties arising from improper selection and marking of drop zones were doubtless due to a lack of proper ground force orientation in the matter prior to the sudden emergence of airdrops as a major source of supply in January and February 1951. As is always the case, once an emergency is at hand, it is too late for orientation in techniques. Thus, the tactical emergency did not permit representatives of the 315th Air Division to meet with ground personnel until late June and early July 1951, at which time a 315th liaison party briefed all personnel responsible for selecting and marking drop zones at battalion and division level. A general meeting of minds regarding outstanding difficulties ensued, and the 315th Air Division also prepared a pamphlet, Supply from the Sky, which was of educational value to ground units.[106] Requirements for airdrop resupply missions, however, dropped off to virtually nothing at the beginning of cease-fire negotiations early in July 1951, with the exception of a few supplies delivered to units cut off by floodwaters, no great amount of materiel was dropped during the remainder of 1951. In the first half of 1952 a series of administrative airdrops furnished supply to isolated radar and communications installations. The 315th Air Division did not neglect training demonstrations, which were of undoubted value in the period of rapid ground force rotation. Through lecture tours and demonstration airdrops in May and June 1952, new Army troops who had not experienced the active combat of early 1951 were prepared for possible future emergency airdrop resupply.[107]

In context with its objective of maintaining a flexible air transport system, the 315th Air Division maintained current readiness for airborne assault missions and successfully managed the airborne operation at Munsan-ni on 23 through 27 March 1951. For one transport command to manage airborne assault in addition to other duties was somewhat at variance with the general thinking of the Airborne Center at Fort Bragg: out of World War II experience, this center taught that airborne assault operations would necessitate establishment of a special airborne task force, comprised of Army and Air personnel and that Air and Airborne units would live and work together for a considerable period of time prior to an airborne assault. Such a concept would tie up aircraft needed for other air missions, while in Japan and Korea shortages of aircraft, trained aircraft crews, maintenance personnel, and suitable bases made such piecemealing of a limited number of aircraft unacceptable. Moreover, the shortage of capable staff personnel prevented the establishment of any additional headquarters. Instead, the 315th Air Division accomplished airborne missions without disrupting the integrity of command by the following measures: maintaining closest possible liaison and coordination between the planning sections of 315th Air Division and the 187th Regimental Combat Team; maintaining airborne proficiency of ground and air units by placing

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emphasis on unit as well as joint training; and utilization of C–54 aircraft, unacceptable as they were for airborne work, for continuous air-landed transport operations. Experience also showed that in a 72-hour stand-down period immediately prior to an all-out airborne effort the air units could have a maximum number of aircraft in commission.[108]

Because of the complexity of airborne assault the 315th Air Division gave airborne training first priority over and above the airlift-type missions, except in times of extreme emergency. Intensive training preceded each airborne mission: before the Sukchon-Sunchon operation (20–23 October 1950) the newly arrived 314th Group was considered sufficiently proficient, but the 21st Squadron was trained in formation flight, slow-ups, low-level navigation, and practice drops; before the Munsan-ni airborne engagement both the 314th and 437th Group practiced battalion and combat team size drops at a training area in Korea.[109] No airborne assault occurred after Munsan-ni, but the 315th Air Division continued vigorous training to maintain the capability on a 72-hour notice. In December 1951 when maintenance groundings of C–119's reduced airborne capability, the 315th undertook to train its C–46 and C–47 units for airborne work. Between January and June 1952, airborne parachute troop and paradrop supply training was greatly emphasized: 581 sorties were flown, dropping 12,185 persons and 233.8 tons of cargo [110] Throughout the period the 315th had in readiness an operational plan for dropping the 187th RCT north of the current battle line.[111] Experience with airborne operations in Korea was on a limited scale, requiring airlift to a regimental combat team which could be provided by a little more than an augmented C–119 group, nevertheless, the 315th Air Division believed that its flexible procedures "can be successful where airborne units of army size and a considerable number of transport groups are involved." [112]

As developed by the 315th Air Division, air evacuation of troop casualties both within Korea and from Korea to Japan was concomitant to cargo hauling, but when necessary, patients were moved without regard to cargo being carried into the field Air evacuation was the responsibility of the 315th Air Division's surgeon, while actual handling was done by the 801st Medical Air Evacuation Squadron. Scheduling was accomplished in the following manner by an air evacuation operation section in the division surgeon's office: daily at noon the Eighth Army medical evacuation officer notified the 315th's surgeon of the number of patients to be moved the following day. Supplementary data from the 801st's liaison officer at Taegu (K–2) gave types and numbers of cases to be moved to Japan and passed on daily information of the number of aircraft needed for the next day's evacuation from forward airstrips. For intra-Japan movements similar information came from the hospital regulating officer of the Japan Logistical Command. When all of this information was received at noon for the following day, the surgeon's office then submitted to 315th's Transport Movement Control a consolidated request, including aircraft type, pick-up point, destination, and loading time, which TMC integrated into its schedule for the next day, giving it a high priority. Whenever possible, the 315th handled air evacuation requests by adding the necessary medical apparatus, nurses, and medical technicians to flights which would carry cargo into the evacuation airfield and then out-load medical evacuees Patients were picked up at forward airstrips by C–47's and lifted usually to Taegu (K–2) or Pusan (K–9) where field station hospitals were located. Under Eighth Army rule, patients requiring hospitalization in excess of 30 days or specialized treatment were airlifted to Japan, head and chest cases to the Tokyo area, frostbite and hepatitis to the Osaka area, and miscellaneous cases to the Fukuoka (Kyushu) area. Within Japan, shifts were made by air from station to general hospitals.[113]

The numbers of air evacuation cases lifted by the 315th Air Division and its predecessor command are shown in figure 18. The dependability and mobility of air evacuation was such that hospital ships were used as floating hospitals rather than as transports

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*MONTHLY MEDICAL AIR EVACUATION IN FEAF**

1 July 1950–30 June 1952

Month	1950	1951	1952
January		10,301	5,541
February		18,137	5,584
March		12,451	5,345
April		10,693	3,847
May		11,051	4,593
June		14,811	4,789
July	831	5,965	
August	800	5,556	
September	7,243	11,869	
October	5,877	12,718	
November	13,880	7,023	
December	20,316	6,249	

* Includes patients airlifted Intra-Japan, Out of Korea, and Intra-Korea
Source USAF Directorate of Statistical Services, Korea, Issue No 1, 30 June 1951, p 56, and Issue No 2, 30 June 1952, p 26

Figure 18

From a humanitarian standpoint, air evacuation improved patient morale. knowing that air would carry him speedily and comfortably to a hospital, he quickly assumed a "worst is over" attitude, lifting his spirits at the very time such was needed The same speed brought a patient to medical centers where specialists were available with the best possible equipment: air travel also caused far less trauma than surface travel over rough roads or railways. As managed in Korea, air evacuation likewise effected economies in trained medical personnel and reduced the need for forward hospitalization facilities. Controlled by a single agency with 24-hour watch over aircraft status and integrated with other transport operations, evacuation aircraft were efficiently dispatched to the airfields where they were needed. The 315th's surgeon aptly pointed out that one medical air evacuation squadron, working with one transport command, accomplished more in Korea than was customary for several MAE squadrons under divergent command in World War II. "For what is probably the first time in the history of warfare," wrote another physician in the *Journal of the American Medical Association,* "the surgeon has had an abundance of air evacuation transport offered him without having to plead for it." [114]

With the beginning of the Kaesong truce talks in July 1951, there was a heartening decline in the numbers of sick and wounded requiring evacuation from Korea each month. Concurrently, however, there was a decreased amount of air cargo lift into Korea, and much of the out-bound space could be now utilized for an expanded rest and recreation troop movement to Japan. "R&R" leaves were rewards allowing limited rehabilitation for combat service in Korea: soldiers received five days in Japan at a station of their choice, and in order to become practicable, travel time had to be kept to a minimum. The Eighth Army instituted Operation RELAX on 30 December 1950, whereby 200 men were given five-day leaves each day, and FEAF inaugurated a similar rest and recreation program for Air Force personnel in Korea on 19 January 1951. By 30 June 1951, a total of 55,661 Eighth Army personnel had been brought to Japan, and except for a few AWOL's they had been returned to Korea.[115] In July 1951 the R&R projects were expanded, and at the request of FEAF Bomber Command a weekly C–54 flight was set up to provide rest leaves for bomber crews on Okinawa. Eighth Army, however, continued to handle the arrangements for the bulk of R&R personnel, a project which it found increasingly complicated by the diffi-

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culty of obtaining information on the number of R&R's arriving in Japan and eliminating delays in disposing of those who had returned to Korea On 18 September 1951 the Far East Command therefore acted to standardize the program, ordering that only "packets" of 46 persons with an officer or NCO would be airlifted. Such "packets" could be more easily accounted for and scheduled for air transportation than could individuals.[116] In 1952 the volume of R&R traffic amounted to a substantial portion of all passengers airlifted: on 6 February, a major day for passengers, some 1,600 of 3,600 persons transported were R&R's. By the end of June 1952 a total of 309,353 individuals had been flown to Japan and back to Korea under the rest and recreation program.[117]

The 315th Air Division also ran scheduled flights, mainly for the carrying of passengers but also for handling some courier mail and cargo. Effective on 1 May 1951, the 315th again assumed the responsibility for the scheduled airlift for passengers, mail, and cargo from Tachikawa to Naha Airfield on Okinawa and Clark Air Force Base in the Philippines, flights which had been taken over by the Military Air Transport Service in July 1950.[118] A weekly flight to Guam was inaugurated in the summer of 1951, and service to Taipeh, Formosa, was initiated on the regular Philippine run, first as a weekly and later a biweekly service. Passengers included military personnel traveling on orders, UNC personnel of various categories, war correspondents, and some VIP's, although VIP's usually required special flights. Cargo was kept to a minimum on scheduled flights, and effective 14 July 1951 parachutes were no longer required on C–54's except when flights were over enemy-held territory, greatly simplifying passenger flights and increasing payloads.[119] Early in February 1952 General Henebry personally welcomed the 1,000,000th passenger to be airlifted by a 315th Air Division aircraft, an Army engineer on rotation back to the United States.[120]

No phase of 315th Air Division effort was of more far-reaching importance than its contributions to the concept of air transportability of Army and Air Force units. Such a concept assumes the existence of a highly mobile force constituting a flexible threat to the enemy and permitting employment in mass and with surprise for maximum effect It allows Air Force units to remain in closest proximity to supported units, either during advance or withdrawal, and increases their striking range and effectiveness. It greatly multiplies the combat potential of relatively small forces and reduces the time of unit noneffectiveness during a movement. An outstanding example of air transport was the "off-the-cuff" movement of the 187th RCT from Ashiya and Brady to Pusan, whence they went by LST to quell rioting of prisoners at Koje-do. Alerted at about 0900 hours on 16 May 1952, the last of 160 transports landed at Pusan (K–9) at 1200 hours, 17 May, completing the lift of 2,361 persons and 889 1 tons of equipment including mortars, vehicles, weapons, and ammunition.[121] In the course of the Korean conflict Air Force units made many air movements, often with little notice, and it became apparent that most of the units were poorly prepared for such moves. What each unit required was trained personnel and suitable equipment, plus a detailed plan for movement by air. Because the emergency nature of troop air transport usually precludes detailed planning subsequent to issuance of movement orders, 315th Air Division prepared a uniform plan for air movement and sent out instructional teams both to lecture and to assist USAF units in the preparation of standing movement plans. A comprehensive booklet, entitled "Here Today—Gone Tomorrow," was given wide distribution in the FEC. Experienced air terminal personnel were also assigned as unit movement teams to assist units and supervise packing, loading, and unloading. With these experienced unit movement teams in charge, transport turnaround time could be held to a minimum. Based on this experience the 315th Air Division stated as an established fact that there would be a continuing need for combat unit training and readiness for air transport in any theater. Experience further showed that the Air Force table of equipment was not completely suited

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to air movement, future planning should place emphasis upon such factors as weight, cubage, design, and versatility of items of equipment before accepting them for organizational property.[122]

Performance records and the rather remarkable flexibility of the 315th Air Division was even more noteworthy when consideration is given to the virtually fixed strength of the organization: among other factors a scarcity of airfield facilities in the Far East dictated that increased transport operations would come from more effective utilization rather than from an appreciable augmentation of unit strength Assigned to the 315th at its activation were the 374th and 437th Troop Carrier Wings, the former located with two squadrons of C–54's at Tachikawa and one squadron (the 21st) of C–47's at Itazuke, and the latter comprising three squadrons of C–46's at Brady Air Base, Kyushu, and one squadron of C–46's at Tachikawa. Attached were the 61st Troop Carrier Group, a MATS subordinate flying C–54's; based with this group at Ashiya were two of its own squadrons and the attached 4th Troop Carrier Squadron. Also attached with station at Ashiya was the 314th Troop Carrier Group, a Tactical Air Command group flying C–119's. Providing services to the two temporary duty transport groups at Ashiya was the provisional 6122d Air Base Group [123] Flying C–47's and attached to the 315th Air Division and in turn to the 21st Squadron was Royal Hellenic Flight No. 13, which had reached Japan on 26 November 1950; a Royal Thai Air Force detachment was also attached to the 21st Squadron upon its arrival on 24 June 1951.[124] As located, these organizations were acceptably based for proper utilization, each being near the originating points of the division airlift Only the 21st Squadron, whose C–47's were best fitted for special air missions and shuttle runs into forward airfields, needed frequent moves: during 1951, for example, it was located at Itazuke, Tachikawa, Taegu (K–2), Kimpo (K–14), and finally at Ashiya.[125]

While they mustered a considerable aircraft strength, the subordinate units of the 315th Air Division showed the marks of their hurried commitment to the Far East hostilities. The anomalous 4th Squadron, which had accompanied the 61st Group to Japan in December 1950 was returned to its parent group at McChord Air Force Base, Washington, on 16 November 1951, less personnel and equipment which were taken by the 14th Squadron of the 61st Group, simultaneously transferred to Japan. Because of congestion at Ashiya, the 4th and later the 14th Squadron were attached to the 374th Wing at Tachikawa. More serious than this administrative mix-up was the undermanned maintenance potential of the 6122d Air Base Group, which provided services for the 61st and 317th Groups at Ashiya; with 704 troop spaces this table of distribution unit maintained a base with a population approaching 5,000 individuals. But for the availability of unskilled indigenous labor in large numbers the group could not have met its duties. General Henebry made several propositions to clear up the difficulties at Ashiya. movement of the 437th Wing there from Brady or establishment of an air base wing. FEAF disapproved efforts to secure a wing organization at Ashiya because it would involve increases in personnel authorizations; but, effective 5 November 1951, it yielded and permitted the redesignation creating the 6122d Air Base Wing, with no change in authorized strength.[126]

Not until April 1952 was it possible for the 315th Air Division thoroughly to revamp its subordinate organizational establishment in a program worked out by Col Cecil H. Childre, who had assumed command of the 315th on 26 February 1952. On 14 April the 403d Troop Carrier Wing, remaining assigned to the Tactical Air Command but attached to the 315th, took station at Ashiya, where having moved less equipment it began building up its three squadrons with C–119's. Since this wing was charged with servicing the 403d and 314th Groups (the latter losing its 37th Squadron for the return of the designation to the ZI), it absorbed personnel and equipment of the discontinued 6122d Air Base Wing. Remaining as attached at Ashiya to the 403d Wing were the 21st and 53d Squadrons, belonging to the 374th and 61st Groups respectively.

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Preparatory to the change at Ashiya, the 61st Troop Carrier Group moved with its 15th Squadron to Tachikawa on 26 March; here the 374th Group with two C–54 squadrons and the 61st Group with two C–54 squadrons shared the services of the 374th Wing. The plan was that the 61st Group would return to the ZI as soon as the 374th completed transition of three squadrons to C–124 aircraft; under this plan the 21st Squadron designation would return to the 374th Group for use by a C–124 squadron formed from personnel and equipment of one of the 61st Group's squadrons. Following the usual USAF practice of according reserve wings with regular designations, the 437th Troop Carrier Wing was inactivated on 10 June 1952 and its personnel and equipment transferred to the simultaneously activated 315th Troop Carrier Wing, comprising a similarly numbered group and the 19th, 34th, 43d, and 344th Squadrons. It was expected that the C–47's of the 21st Squadron would be transferred to an assault squadron attached to the 315th Group at such date as the 21st was reequipped with C–124's.[127] The immediate effect of this reorganization was to provide wing structures at Ashiya, Brady, and Tachikawa; since the 314th Group arrived without planes there was no immediate increase in flight strength.

In its Korean airlift the 315th Air Division employed the 15-year-old C–47, the 10-year-old C–46, and the 10-year-old C–54. Its most modern operational transport, the C–119, was a development of the World War II C–82. Aircraft and crews possessed and the performance record of these planes during the year July 1951 through June 1952 is shown in figure 19. With modern aircraft of the C–123 and C–124 type, the 315th Air Division estimated that it could have accomplished its mission with about one-half the aircrews and one-third the aircraft and airfield congestion. While it considered neither the C–123 nor the C–124 to be the "complete answer" in moving and supplying armies by air, they were "a stride in the right direction."[128]

The 315th Air Division nevertheless effected the utmost utilization of the peculiar talents of its possessed aircraft. The major personnel and cargo carrier and medical air evacuation plane was the C–54, which, being unsuited for airborne assault operations, could maintain a continuous air-landed lift. Benefiting from "beefed up" crew status, the C–54 could be counted upon for seven flying hours daily.

315TH AIR DIVISION AIRCRAFT PERFORMANCE

1 July 1951–30 June 1952

Total or Average

	C-54	C-119	C-47	C-46
Average Aircraft Possessed ..	60	71	25	57
Average Aircraft Combat Ready	46	41	18	42
Per Cent Combat Ready .	77	58	72	74
Average Crews Possessed	127	88	43	98
Number of Sorties	33,224	9,281	11,649	14,771
Number of Flying Hours	122,207	31,106	26,622	60,623
Per Average Aircraft Possessed	2,035	438	1,064	1,064
Total Tons Cargo Carried	132,270	27,425	17,117	34,135
Per Average Aircraft Possessed	2,204	386	685	599
Total Passengers .	856,503	24,650	95,587	148,656
Per Average Aircraft Possessed.	14,274	347	3,823	2,608
Patients	41,430		36,225	1,076
Other .	815,103	24,650	59,362	147,580

Source USAF Directorate of Statistical Services, Korea, Issue No. 2, 30 June 1952

Figure 19

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With some risk it could get into a 3,500-foot Korean runway with a reduced gross landing weight of 65,000 pounds. As employed in Korea, however, the C–54 had adverse aspects: unloading of heavy cargo from a floor height of 108 inches was a problem defying fully adequate solution; the plane needed reversible-pitch propellers for short field landings; and without self-sealing fuel tanks the C–54 would have been extremely vulnerable had it had to confront enemy air or ground fire.[129] For shuttle runs into the rough forward Korean airstrips, the C–47's of the 21st Squadron proved invaluable from the first months of hostilities: the planes gave little trouble and could be counted on for three hours' use each day. Their major limitation, however, was a low three-ton payload (the C–123 had a nine-ton payload); with their limited load the C–47's could be expected to cause a good amount of congestion at forward bases.[130] With a four-hour-a-day utilization rate, the C–46's could haul cargo and personnel and were able to drop paratroopers or parasupply bundles, the latter requiring that they make multiple passes over a drop zone to discharge a full load of door bundles. During April 1951, when all C–119's were grounded, the 437th Group successfully filled airdrop supply commitments.[131]

Counted by General Tunner as a "fundamentally sound" airplane which might "well become the medium transport workhorse of the USAF," [132] the C–119 possessed many valuable characteristics: its roomy and rear-loading cargo compartment could accommodate bulky equipment and allow ease of handling. With clam-shell doors removed, the C–119 could release a full cargo of paratroopers or palleted supplies in one pass over a drop zone. But from a maintenance standpoint the C–119 was a "problem child." Originally dispatched to Korea for a supposedly short stay and a single airborne operation, logistic support for the group was so limited that General Tunner in December 1950 counted on flying the C–119 for only two hours a day; defects in the C–119 materialized so frequently that the 315th Air Division could predict no more than 2 5 hours utilization for the C–119's in the last half of 1951.[133] FEAF attributed the structural troubles of the C–119's to the fact that design criteria were based on anticipated operations from well established concrete runways,[134] and doubtless the majority of structural failures were due to operations into the rough Korean airfields. Many of the failures were minor, but collectively they occasioned an excessive man-hour maintenance responsibility and contributed to a number of accidents. Perhaps the most severe structural failure appeared on 29 March 1951 when two planes had engines fall off in flight, resulting in a fatal crash for one of them. All C–119's were immediately grounded until reinforcing beams and brackets for their nacelle truss structures, flown from the United States, could be installed. As a result of expedited work, the first modified C–119 was flyable on 18 April and others followed, but the difficulty held the April in-commission rate for those planes down to 16.8 per cent.[135] Although the 314th Group utilized controlled cannibalism and substituted parts whenever possible, the C–119's generally had the highest AOCP rate in FEAF, averaging 11 per cent of assigned aircraft per day for the first 10 months of operations in Korea.[136] In addition to the major problem of keeping the C–119B and C–119C type aircraft in operation, the Flying Boxcars had several disadvantages in cargo and personnel hauling: landing-gear weaknesses forced reduction of a maximum 70,000-pound gross take-off load limit to 64,000 pounds, reducing hauling capacity; cabin noise, deficiency in single-engine flight characteristics, and poor ditching or crash-landing capabilities made the plane a doubtful personnel carrier and virtually prohibited its use for medical air evacuation.[137]

Desirous of testing his hypothesis that newer types of transport aircraft would boost the efficiency of the Korean airlift, General Henebry in April 1951 requested that a flight of C–124 aircraft be made available to his command for testing as replacements for C–54's.[138] While none of the giant transports could be immediately assigned, USAF directed

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that the Air Proving Ground cooperate with FEAF to test the operational suitability of a C–124A in the Far East. With the assurance that the tire pressure weight of this plane was not greatly in excess of that of a C–54, although the C–124 had a gross take-off weight of 175,000 pounds, Fifth Air Force cleared Kimpo (K–14), Pusan (K–9), Chunchon (K–47), and Taegu (K–2) for the operational tests. The first payload flight into Korea was made on 27 September 1951, when 20,300 pounds of aircraft parts were airlifted to K–14, and before concluding the tests on 20 October the C–124 made 13 trips to Korea and back to Japan, or a total of 26 flights. On 17 flights the plane carried cargo, ranging from 11,386 pounds of mail and general cargo to a record loading of 48,920 pounds, mostly hand grenades, flown from Ashiya to Kimpo. Among largest items carried was a GCA unit consisting of two van trailers. As an average, the C–124 carried a cargo load of 34,400 pounds, double the maximum carried on the same runs by C–54's. The aircraft could be utilized as well on short-range, high payload flights as on long-range flights: with a minimum crew and fuel reserves one C–124 could replace three C–54-type aircraft. Since center seats were lacking, troop transportation was limited to 105 passengers per flight. On four return trips from Korea the plane brought medical air evacuation patients to Japan, the largest number handled being 165 (103 litter cases and 62 ambulatory) which were flown from Pusan (K–9) to Itami. Flight nurses and technicians commented favorably: there would be a saving in medical crew, it was easier to load patients on one plane than on several, the C–124's capacity made it possible to reduce the length of holding periods. The C–124 also proved able to operate from the steel-mat, asphalt, and concrete runways in Japan and Korea without damage to the air facilities; it promised to relieve congestion by performing the work of a greater number of C–54's.[139]

The results of the test flights indicated that the C–124 could and should be used in airlift missions in the Far East and prompted General Henebry to request an early conversion of the 374th Troop Carrier Wing from C–54's to C–124's, already projected by USAF for the second quarter of fiscal year 1952. Plans were laid to convert the two 374th Group squadrons based at Tachikawa, and ground schools were instituted to facilitate the transition. Delivery of the giant transports went according to an accelerated schedule, with a total of 13 delivered in May and June 1952. In May the first six C–124's were used for flight training, while the planes received in June were assigned to the 6th Troop Carrier Squadron. Operational flights began on 3 July 1952, giving every indication that the new C–124's would greatly benefit the Korean airlift.[140]

While tests on the C–124 were under way in October 1951, General Henebry received through FEAF a USAF proposition that the C–54's of the 61st Group should be exchanged for an additional C–119 wing.[141] The proposition promised some advantages to the 315th Air Division: establishment of a wing structure at Ashiya would undoubtedly strengthen the C–119 program and, for the first time, the command would possess sufficient numbers of the C–119's to drop all the 187th Airborne RCT at one time.[142] As the proposition matured into a plan, however, the 403d Troop Carrier Wing, with three squadrons, would be transferred to Japan less aircraft, one of its squadrons to be immediately equipped in the theater with the materiel assigned to the 314th Group's 37th Squadron, which would be returned to the ZI in a paper transfer. The 403d would also take the excess C–119's of the 314th Group (70 were currently assigned in March), and both groups, with 48 aircraft authorized, would then be organized with three squadrons.[143] This plan was effected in April when the 403d Wing reached Japan. The prospect of receiving more C–119's, while some 110,000 man-hours a month (of which only about 55,000 were available) were required for the maintenance of the 70 at Ashiya, caused some discomfort,[144] leading to a 6122d Air Base Wing study recommending replacement of all C–119's with suitable troop carrier planes incorporating all production

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changes and technical order compliances. Alternately, C–119's would need a complete reconditioning program in the United States, with the 315th Air Division receiving a completely serviceable C–119 before the departure of one of its planes for reconditioning.[145] While solution to the problem was pending, C–119 in-commission rates spiraled further downward: a thorough study of 403d Wing aircraft in June 1952 showed that of 68 assigned only 14 were marginally safe for operation and the balance were completely unairworthy. The USAF solution announced in April, however, held promise: in late June the Tactical Air Command was scheduled to transfer five C–119's to the 403d Wing, and after 1 July it was to transfer C–119's on a one for one basis, eventually bringing the strength up to the 96 authorized aircraft. After a special trip to Washington about the matter, Brig. Gen. Chester E. McCarty, who had taken command of the 315th Air Division on 10 April 1952, was confident that the C–119 situation would begin to show improvement.[146]

AIR RESCUE*

After visiting the Far East in the spring of 1951, Maj. Gen. Harry G. Armstrong, the USAF Surgeon General, stated that "the remarkable achievement of the 3d Air Rescue Squadron and of the 801st Medical Air Evacuation Squadron . . . is one of the brightest chapters in the history of our Air Force." [147] With the 3d Squadron employing helicopters to lift front-line casualties and with air evacuation rearward under medical care of the 801st, movement by air spared seriously wounded patients the long, wearing trips over almost impassable roads, and the added speed with which they could receive adequate medical attention undoubtedly contributed to the low death rate in Korea, only 25 deaths occurring among 1,000 men wounded as compared with 45 deaths per 1,000 wounded in World War II.[148] Moreover, knowing that an air rescue plane would pick them up behind enemy lines or in the offshore waters was a powerful morale builder to an aircrew.

Responsible for air rescue in the Far East were the 2d and 3d Air Rescue Squadrons, assigned to the MATS Air Rescue Service but attached to FEAF. The 2d Squadron based its flights in the Philippines and Okinawa, one of the duties of SB–29 rescue planes at the latter station being to accompany B–29 missions to and from the coast-in point at Korea. With its headquarters at Johnson Air Base, the 3d Squadron had flights at Johnson, Yokota, Misawa, and Ashiya, comprising varied strength allocations of SB–29's, C–47's, SB–17's, SA–16 amphibians, and a few H–5 helicopters, as well as crash boats. As the result of successful evacuation of front-line troop casualties with the relatively few H–5's available, Detachment F of the 3d Squadron was formed at Taegu on 24 September 1950 With the drive into North Korea the detachment moved northward, only to retreat again to Taegu and then at the end of 1951 to stabilize itself at Yongdungpo, near Seoul municipal airfield (K–16). Augmented with personnel required to man a rescue control center, the unit was reorganized as Detachment 1, 3d Air Rescue Squadron, on 22 June 1951. The record of this small squadron in saving life was impressive: between 25 June 1950 and 30 June 1952, 5,258 persons had been picked up and evacuated, 864 of them having been retrieved from beyond the enemy lines Of these totals the H–5 helicopters had saved 4,573, going behind enemy lines to pick up 719 men.[149]

The greatest part of the rescue work was that of evacuating severely wounded soldiers from the front-line areas, often from positions in advance of battalion aid stations. When a man received a head wound, sucking chest wound, or stomach wound, the speed with which he could receive hospital attention meant life or death. With I Corps the following procedures were used by Detachment 1: a battalion aid station notified by telephone the surgeon's office at I Corps of the location

*Unless otherwise cited information in this section is from the quarterly Historical Data, Air Rescue Service, MATS, January 1951–June 1952

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of the wounded soldier; possessing direct communications with the helicopter element at the 8055th Mobile Army Surgical Hospital, the I Corps surgeon gave the element commander the exact UTM grid coordinates, the type of wound, security of the area from enemy attack, and the type of marker to be used; the pilot and medical technician made the necessary pickup. With such procedure it was not unusual to have a patient delivered to surgery in less than an hour after being wounded. According to the Eighth Army surgeon, over 50 per cent of persons evacuated by helicopter would have died had they been carried to the rear by surface transport.[150] In December 1951 and January 1952 FEAF sponsored an unusual evacuation operation involving use of helicopters, C–47's and C–54's, and the Navy hospital ship *Consolation*. Detachment 1 helicopters brought front-line casualties to a forward strip at Pupyong-ni (K–51), where they were off-loaded to C–47 aircraft of the 315th Air Division and flown over some of the highest mountains in Korea to a seashore landing strip at Sokchori (K–50). Here two helicopters were on station to ferry patients to the *Consolation* lying two miles offshore and equipped with a 60-foot-square helicopter deck. After hospitalization, patients were helicoptered back to K–50 whence they were flown to the Tokyo area by C–54's. By 24 January 1952, when the experiment was suspended, some 315 patients had been flown to the *Consolation*. The procedure was nevertheless counted as impractical as it was then employed: although USAF, Army, and Marine helicopters were used, they were insufficient in number; moreover, the handling of patients was excessive.[151]

At other critical junctures the 3d Air Rescue Squadron was of service to Eighth Army. When elements of the U.S. 2d Division were surrounded at Chipyong in mid-February 1951, six H–5's on the afternoon of the 15th delivered blankets, blood plasma, and medical supplies and took out the most serious casualties, each helicopter making three trips. The next day, four H–5's weathered a 40-knot wind and a blinding snowstorm, to fly low and slowly up the road to Chipyong. They evacuated 22 wounded men, bringing the two-day total to 52 lives saved. On 24 and 25 March 1951 the helicopters flew 77 sorties in support of the airborne jump at Munsan-ni, evacuating 148 wounded and injured paratroopers in the face of intense mortar and small-arms fire which damaged two helicopters. Again in August 1951 when flash floods isolated groups of UN troops in front-line positions, the helicopters were of service: on the 11th they lifted 83 Turkish troopers to the safety of high ground, and on the 29th they rescued a 58-man patrol from the wrong side of the swollen Injin River and on the same day hoisted 14 Army engineers from a pontoon bridge which had broken loose in the floodwaters.

More spectacular and decidely more hazardous for the fragile H–5's and unarmed SA–16 amphibians were pickup missions for downed airmen. While the rescue plane could normally expect some form of enemy fire north of the battle line, the missions were substantial morale builders for other airmen who knew that they stood a good chance of rescue if they were shot down or if they parachuted in enemy territory. Fifth Air Force fragmentary field orders for each day's operations carried directions for the stations of rescue aircraft so as to maintain them in proximity to strike targets. Ordinarily the procedure for planes in distress was to head for offshore waters where the pilot could ditch or parachute without danger from the enemy and where he might be picked up by a crash boat, patrol craft, or rescue service amphibian. Thus on 13 September 1951 a jet pilot whose engine failed at 27,000 feet notified a patrolling SA–16 Albatross amphibian, giving his intended point of bail-out; when he landed, the air rescue plane was already there waiting in the water and it took just three minutes to get him aboard.[152]

When a pilot crash-landed or bailed out over enemy-held territory, however, Fifth Air Force procedure required his flight and squadron to provide a low and top cover CAP over him, the leader meantime notifying the TACC (Snowflake) via the emergency radio channel of the

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exact grid coordination of the downed pilot, his observed condition, enemy activity in the area, and the length of time the CAP could be maintained One covering flight, desirably containing at least one pilot who had seen the man on the ground, was sent for refueling; it could be ordered to escort the rescue plane to the area. At the TACC the rescue controller alerted the nearest helicopter or SA–16, according to the landing terrain, and obtained fighters for escort and CAP support. It was desirable to have a Mosquito in the area to act as controller, but more generally the CAP leader kept the downed airman in view and directed neutralization of enemy positions endangering him The downed pilot could also direct the low cover by means of his URC–4 escape and evasion kit radio set. Usually a helicopter would make the rescue, and on arrival the CAP leader would have located a possible landing ground and would have observed wind direction and velocity. With this information available on arrival, the helicopter could attempt an immediate pickup, while the CAP strafed all enemy positions constantly as the helicopter approached, made the pickup, and left the area. Because of the vulnerability of the helicopter it was most advisable for the CAP to presuppose heavy enemy ground activity, holding one flight to make passes at any position the rescue pilot directed. Finally, the CAP would escort the plane back to friendly territory. Similar CAP flights covered SA–16 landings in North Korean coastal waters or rivers. When a pilot abandoned his plane over friendly territory, a smaller CAP and no neutralization would suffice.[153]

The record of the 3d Air Rescue Squadron was impressive, with each venture worthy of telling. During March 1951, for example, the squadron saved six out of seven 35th Fighter Group pilots forced down behind enemy lines, one pickup being performed 20 minutes after the pilot was shot down and another involving hazardous night flying in a helicopter not designed for such work. These rescues were a part of the record of outstanding achievement cited by General Stratemeyer in commendation of the squadron.[154] On the night of 11 June 1951 an SA–16 pilot landed his amphibian in the shallow, debris-filled Taedong River to recover an F–51 pilot, while the downed pilot's squadron mates beat down heavy enemy fire and gave some illumination with their landing lights.[155] While this humanitarian work was deadly serious, it was not without its lighter moments: hit by flak a B–26 limped back to friendly territory where the gunner bailed out as ordered, an alert helicopter picked him up and returned him to Taegu in time to witness his crew's safe crash landing.[156] On 7 June 1951, the wingman of a flight of F–80's flamed out at 20,000 feet and after a long radio conversation with his flight leader decided to belly-in on a hard packed river bed. All the time a rescue SC–47 was in the area waiting to break in on the extended conversation, finally he got in a call. "This is Rescue Playmate, where are you going to belly-in?" "My God," exclaimed the troubled jet pilot, "what the hell do you fellows do, just hang around like vultures waiting for us to clobber in?" He was soon saved.[157]

The Sikorsky H–5 helicopter had not been built for combat operations, it had no armament of its own, and neither the pilot nor the vital parts of the plane were afforded protection from enemy fire. Surprisingly, however, the helicopter's slow speed was an aid to flak evasion, most hostile bursts were noted to be very accurate as to altitude but tracking away from the helicopter. When caught in flak, all Detachment 1 pilots immediately altered altitude and direction as rapidly as aircraft characteristics would permit. In medical evacuation the H–5 carried a pilot and technician and could lift two patients in external litter capsules; when two heavy patients were lifted, however, the load exceeded that for which the plane was designed and the capsules also magnified turbulence. In initial Korean employment the H–5 lacked the instruments needed for night flying. Since the helicopter elements of Detachment 1 were widely scattered at operational sites, field maintenance on the compli-

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cated aircraft was additionally difficult.[158] In short, the H–5 had an inadequate payload, insufficient power, short range, insufficient forward speed, and no all-weather characteristics (fabric covered rotors deteriorated when flown in the rain).[159] In March 1951 an Air Proving Ground detachment flew a Sikorsky H–19 to Korea in a C–124 and began two and one-half months of combat tests, ending in June when the H–19 was turned over to Detachment 1. This plane was a larger version of the H–5, being able to carry 8 litter patients or 10 passengers plus the pilot and medical attendant. The day after its arrival, the H–19 flew aerial evacuation missions to and from the paratroop jump area at Munsan-ni, satisfactorily demonstrating its greater range and bigger payload. In its operations with Detachment 1, however, the H–19 proved to be a complement to the H–5 rather than its replacement: most medical evacuations were limited to one or two patients while most aircrew pickups in enemy territory were of single pilots, missions which the H–5 could handle better than the H–19 On missions demanding evacuation of larger numbers of men, the H–19 possessed the best capability. Detachment 1 therefore continued to employ the H–5's for routine work and held the two H–19's which it received during 1951 in reserve for special tasks.[160]

Despite the fact that the H–5 helicopter could be counted as an obsolescent type, FEAF was not able to secure as many of these aircraft as it needed, even though practically all that the USAF had capable of field service were transferred to the 3d Air Rescue Squadron. In January 1951 FEAF held 14 H–5's but wanted 31 for its 2 rescue squadrons; on 23 February USAF undertook to support the 3d Squadron at a strength of 23 H–5's but indicated that the 2d Squadron must take its chances with other ARS units.[161] General Stratemeyer's next proposal noted that emergency evacuation and courier work was not properly the function of an air rescue squadron; he therefore asked for a special helicopter squadron of H–19's and, when these could not be authorized, requested a liaison squadron comprising 12 H–5's and 12 L–20 Beavers. The USAF solution was to grant FEAF the 10th Liaison Squadron, initially equipped with L–5's until such time as helicopters and newer model liaison planes could be provided.[162] Activated by Fifth Air Force on 25 July at Seoul (K–16) airport, the 10th Liaison Squadron proved welcome for liaison service especially between the JOC and TADC's in the field.[163] On 24 July FEAF again requested units: in addition to the 10th Squadron it required another liaison squadron with 18 L–20's and 6 helicopters for service in Japan, and to provide front-line medical air evacuation, it required a squadron of H–19 helicopters for assignment to the 315th Air Division. USAF accepted the requirement for possible future programming, but for the time being it had no liaison or helicopter unit for assignment to FEAF; the Air Rescue Service, moreover, would have first priority in the allocation of H–19's received from production.[164]

WEATHER SERVICES

Unlike certain other east Asian areas, the source for most of the variation in Korea's climate was the annual progression of the seasons and the cyclic alternation of the south and north monsoons of summer and winter. In the intervening periods of spring and fall the wind flow had no persistent direction From year to year the seasons varied by a few weeks, but the winter season usually encompassed November through March, summer was June through August, and the other four months comprised spring and fall. In the winter a northerly wind flow brought very cold and dry air from the continental interior of Asia, dropping the temperatures of north and central Korea to as low as minus 30° F. but moderating in southern Korea. Since the air was excessively dry, it supported little cloudiness; clear or nearly clear days were frequent and visibility was at its annual

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maximum. Smoke, near heavily populated areas, was the principal visibility restriction. High surface and upper level wind velocities were normal, commonly reaching 100 knots at 10,000 feet and 170 knots at 20,000 feet above sea level Air routes were often subject to severe icing and turbulent conditions. During April and May the direction of wind flow over Korea was variable, with a resulting rapid alternation of fair and cloudy weather. Precipitation, cloudiness, fog, and lowered visibility increased The southerly flow of winds in the summer season was normal, but the summer winds were never as persistent as the northerly flow of winter. Warm and moist tropical air nevertheless supported heavy convective cloudiness, and rain was both intense and frequent, with the most intense rainfall accompanying typhoon passages at the end of summer. The greatest incidence of low visibility and fog came in July Fall, like spring, brought a variable wind direction, but tropical storms and typhoons increased the precipitation. However, there were usually a few more clear days than in spring, and after August dense fogs were rare.[165]

While these seasonal climatic variations were normal, the prediction of weather with a degree of accuracy necessary to aerial operation in Korea was complicated by the geographical situation of that peninsula in relation to enemy-held areas of Asia, which furnished little weather forecasting data. The problem becomes manifest with an analogy of a theoretically similar situation in America: the problem was similar to forecasting for the state of Florida without data north or west of Tampa except a few ship reports, and even the forecasts for semitropical Florida would be more simple than predicting for mountainous Korea which is surrounded by several thousand square miles of warm ocean currents Weather forecasting was nevertheless of great importance to Korean military operations. Doubtless the Communists utilized little of the scientific procedure available to UN forces, but from the initial Korean attack they habitually timed their ground assaults to coincide with periods of poor flying weather Communist documents indicate that June 1950 was selected for the invasion of South Korea because it would be followed normally by two months of relatively poor weather[166] There was also reason to believe that the Chinese Communists, knowing that the UN Command would destroy most North Korean bridges, waited until inland waters froze before launching their attack in November 1950.[167]

Climatology also had its importance to UN Command operations: the state of the tide dictated the invasion day at Inchon in September 1950 and the thawing of Yalu River ice brought renewed air attacks against the Sinuiju bridges in March and April 1951 Korean operations demonstrated, moreover, that the USAF had not become an all-weather air force. Operating from bases with GCA facilities, the medium bombers combined radar and visual techniques on bomb runs to achieve their objective visually through as much as $\frac{7}{10}$ cloud cover; utilizing radar and bomber stream tactics when visibility would not permit formation flying, they achieved good results against area targets; but icing and high wind velocities seriously interfered with B–29 efforts to destroy the Yalu bridges in the winter of 1950–51. Normal cargo flights over established terminals equipped with homers and GCA had to be prohibited when the ceiling was less than 300 feet and visibility less than a mile at terminals; any degree of turbulence adversely affected medical air evacuation and such types of flight also demanded more than the minimum ceilings and visibility. Ice formations on wings and tail surfaces turned back a number of 3d Bombardment Group B–26 intruder missions in the winter of 1950–51. Cloud cover over targets caused more photographic reconnaissance mission aborts than any other single factor. Fuel-hungry jet fighters had very slender tolerance to spare for adverse weather: unfavorable winds aloft could jeopardize a mission, and suddenly changing weather which restricted visibility at a Korean airfield could assume serious proportions when the jets returned from a mission with only enough fuel left to make one attempt at landing. Close-support sorties had to be canceled when cloud bases

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were less than 6,000 feet and visibility was less than 3 miles. Airborne operations were prohibited by ceilings of less than 3,000 feet, visibilities of less than 2 miles, moderate to severe turbulence, and surface winds greater than 15 knots.[168] Finally, the approach and passing of a typhoon not only commonly forced the stand-down of all aircraft but demanded evacuation of aircraft from bases in the path of the storm.

Weather services in the Far East were provided by the 2143d Air Weather Wing of the MATS Air Weather Service. At the beginning of the Korean war the 2143d consisted of three ground weather squadrons: the 20th Weather Squadron in Japan, the 15th Weather Squadron serving the Philippines, Okinawa, and Guam, and the 31st Weather Squadron in the Hawaiian and Marshall Islands. In order to control the additional detachments needed for Korea as well as to provide specialized services for the Fifth Air Force, the wing activated the 30th Weather Squadron effective 16 November 1950. Assigned to the wing in June 1950 were two aerial weather reconnaissance squadrons: the 512th in Japan and the 514th at Guam, the latter primarily concerned with flying synoptic reconnaissance and typhoon missions. In a general reorganization of all such AWS weather reconnaissance squadrons, the 512th and 514th were inactivated and reactivated as the 56th and 54th Strategic Reconnaissance Squadrons, Medium, Weather, on 21 February 1951. The general organizational concept of the AWS was to align the weather service with major commands wherever possible: on 20 May 1952 reorganization therefore discontinued the 31st Weather Squadron, assigning the detachments at Hickam and Johnson Island to a Zone of Interior weather group and the detachment at Eniwetok to the 15th Squadron. At this time the 57th Strategic Reconnaissance Squadron, Weather, based at Hickam AFB, was assigned to the 2143d Wing for synoptic and typhoon reconnaissance. Simultaneously, the Tokyo Weather Central was discontinued as a 20th Weather Squadron detachment and organized as a staff section of the 2143d Wing, the plan being that the 20th Squadron should eventually be divided into two squadrons, one to serve the Japan Air Defense Force and the second to work with other USAF activities in Japan.[169]

The 2143d Air Weather Wing was the UNC's primary source of weather observations and forecasts, climatological and oceanographic studies, and other special forecasts. The wing commander served also as staff weather officer for FEAF. Nerve center for weather service to the UNC was the Tokyo Weather Central, which supported FEAF and provided field detachments with weather analyses and forecasts transmitted by facsimile, teletype, and radio telegraph The NAVFE relied on the 2143d for meteorological support and maintained its aerological office adjacent to the Tokyo Weather Central The 2143d Wing also had responsibilities for providing weather services for the entire western and central Pacific, including those needed by the MATS Pacific airlift. It supervised the functions of the Japanese and Ryukyuan Weather Services and training for the reestablishment of a Korean Weather Service; after the conclusion of the Japanese peace treaty it continued close cooperation with the now independent Japanese Weather Service.[170]

Associated as it was with the tactical operations of the Fifth Air Force, the 30th Weather Squadron located in Korea held a heavy obligation for both weather observation and local forecasting. This squadron maintained detachments at the principal Korean airfields, and during the period of 1951 when Fifth Air Force strength was based there, controlled the station detachments on Kyushu airfields. Being well back of UN lines, however, these detachments had a limited ability for the observation of the prevalent northerly and westerly flow of weather into Korea. In order to establish weather observation posts on the front lines, a supply of one-man observing kits (AN/PMQ–2) had been shipped to Japan during September 1950, and, after initial success, the Eighth Army late in December 1950 approved a plan to attach two-man weather-observation teams to each of its corps, the team to be permitted a short transmission via Army CW radio each hour. Going into action at the time of general disruption caused by

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the Chinese invasion, these two-man teams gave admirable service; similar teams, moreover, were established at small Korean airfields where traffic was too light to justify a detachment and at isolated locations, including Cheju, Sochong, and somewhat later Paengyong and Cho-do islands. Since the AN/PMQ-4 kit weighed only six pounds, the two-man team possessed admirable mobility, and other than a rugged life in the field the only real problem for the teams was that of access to communications. Army or Air Force telephone was the most expeditious means of getting the hourly reports to the Fifth Air Force Weather Station, but when a telephone circuit was not available, the reports were transmitted by Army CW radio to the JOC. Although there were delays, at least 90 per cent of the reports from the two-man teams were getting through during the spring of 1951 when ground operations were at a maximum of movement. The reports of these teams were found to be of great value in Korea where most close-support fighter strikes were less than an hour in duration and more dependent upon up-to-the-minute observations than upon forecast weather.[171]

Had it not been for aerial weather reconnaissance, the success of the air weather services in Korea would have been considerably restricted by its inability to secure weather observations from areas north of the battle line or over the Yellow Sea, where so much of the prevailing Korean weather made up At the beginning of hostilities the 512th Reconnaissance Squadron began daily BUZZARD missions over North Korea and adjacent waters, and in the early months of the war the WB-29's of this squadron customarily returned from weather patrols by way of a zigzag course across the battle area, transmitting an early morning weather summary which was often the determining factor in whether fighter strikes would get off from Itazuke.[172] These missions would be continued each day, but tactical weather observations were assumed by other units. Beginning on 28 July 1950 weather forecasters were placed aboard bombers or reconnaissance aircraft over North Korea. That same month the 6143d Wing informed FEAF of its requirement for a tactical weather reconnaissance unit, but such was not immediately forthcoming. Beginning in October 1950, however, two F-82's of the 68th Fighter All-Weather Squadron flew pre-dawn weather reconnaissance missions over North Korea.[173] Effective on 25 December 1950 the Fifth Air Force organized the 6166th Air-Weather Reconnaissance Flight, attached to the 543d Tactical Support Group at Taegu and later to the 67th Tactical Reconnaissance Wing. Authorized six unarmed B-26's, this flight commenced operations on the night of 7 February 1951 and thereafter commonly flew several prebriefed routes over the Yellow Sea and over North Korea and such other special coverage as the JOC might direct.[174] Daily missions for this flight were detailed by the JOC after consultation with the Fifth Air Force weather officer, who also commanded the 30th Weather Squadron. This officer also recommended the assignment of rated weather officers to command the flight and furnished aerial weather observers.[175]

The 6166th Flight and the BUZZARD KING mission of the 512th Squadron, which was continued after the 6166th began operations, furnished reconnaissance over areas from which reliable synoptic data was not otherwise available Target-weather reconnaissance in Korea was flown by strike aircraft as well as weather planes, such missions either being preplanned by the JOC and set up in operations orders or a call-type in which the JOC directed a tactical wing to dispatch a flight, usually when there were threatened deteriorations in forecast weather which had to be checked. Pilot reports (PIREPS) from all tactical flights into and out of a target area likewise furnished weather information and usually comprised the most immediate data available to a staff weather officer. After stressing the importance of PIREPS the 30th Weather Squadron had about 80 filed daily during January 1951, about half from transport aircraft and the remainder from debriefing of fighter and light bomber crews. To prevent overloading of communications circuits, the squadron then stressed quality

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rather than quantity and within a few months was dispatching consolidated summaries of PIREPS for three-hour periods rather than the single reports as they were received; to obtain briefing information immediately before a mission, staff weather officers were authorized to use the "hot line" to the JOC.[176] Validity of this source of weather information was additionally strengthened in August 1951 when FEAF directed that all aircrew members would, as a secondary mission, observe and transmit weather information from enemy territory. As requested by FEAF, staff weather officers of the 2143d Wing instituted training programs designed to provide aircrew personnel with the necessary background for making and reporting sound weather observations.[177]

Based upon such a 24-hour flow of weather observations, staff weather officers prepared their individual forecasts and furnished the weather briefing required for ordering and conducting aerial operations. (See figure 20.) Thus in Korea the prime responsibility for analysis lay upon the Fifth Air Force Weather Station, which supported the commanding officer of the 30th Weather Squadron in his duty as Fifth Air Force staff weather officer. This station prepared forecasts and maintained evaluated current weather information for dissemination. At this level the most important forecast was issued at 1300 hours each day, and furnished a detailed coverage of weather expected that night and all the next day. On the basis of this forecast, JOC was able to plan the following day's operations. Nightly at 1800 hours weather officers participated in the formal staff briefing of the Fifth Air Force and Eighth Army commanders. Throughout the day there were other briefings for the Fifth Air Force staff, and constant contact was maintained with JOC duty officers to keep them apprised of current and expected weather conditions.[178]

At the combat group level a staff weather officer bore the responsibility for both forecasting and briefing. The necessity for these versatile officers had been indicated early in the Korean operations, but USAF, feeling that weather station detachments could provide forecasting and briefing, had disapproved FEAF's request for the addition of a staff weather officer to tactical group headquarters. The 6143d Wing had nevertheless furnished some of these officers from its own resources, and on 1 June 1951 USAF approval was secured for a compromise whereby the Air Weather Service was provided authorization for the tactical staff weather officers who were attached to combat groups.[179] In Korea the tactical staff weather officer's day varied with the type of unit to which he was attached, beginning any time between 0230 and 0700 with a visit to the station weather detachment. Here he developed an independent forecast, and, after discussing it with the station duty forecaster, he held a second conference by telephone with the Fifth Air Force Weather Station so resolving any divergence between the mission forecasts which would be presented to the JOC and to the tactical group. After this preliminary work, the tactical staff weather officer proceeded to combat operations where he might either brief the group commander and operations officer or post his forecast and current base and target weather on the display board in operations. He next participated in combat briefings, varying in number and time by the mission of the combat group. When the mission returned, he interrogated the crew for weather information and delivered the PIREPS to the base weather station. After questioning the crews, the tactical staff weather officer evaluated his forecasts to determine the cause for any errors which he might have made.[180]

Although all forecasters worked independently, constant efforts were made to secure uniform as well as accurate forecasts. All the forecasters depended heavily upon the weather prophecies and map analyses provided via facsimile and teletype by the Tokyo Weather Central. This data was based upon a greater wealth of weather information than was commonly available in Korea. On 1 September 1951 the Tokyo Weather Central began transmitting a "Korean Operational Forecast" with a valid time from 0800 to 1700 hours. Received at tactical bases shortly after midnight, the forecast was of great value for pre-

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OPERATIONS OF THE KOREAN WEATHER SERVICE

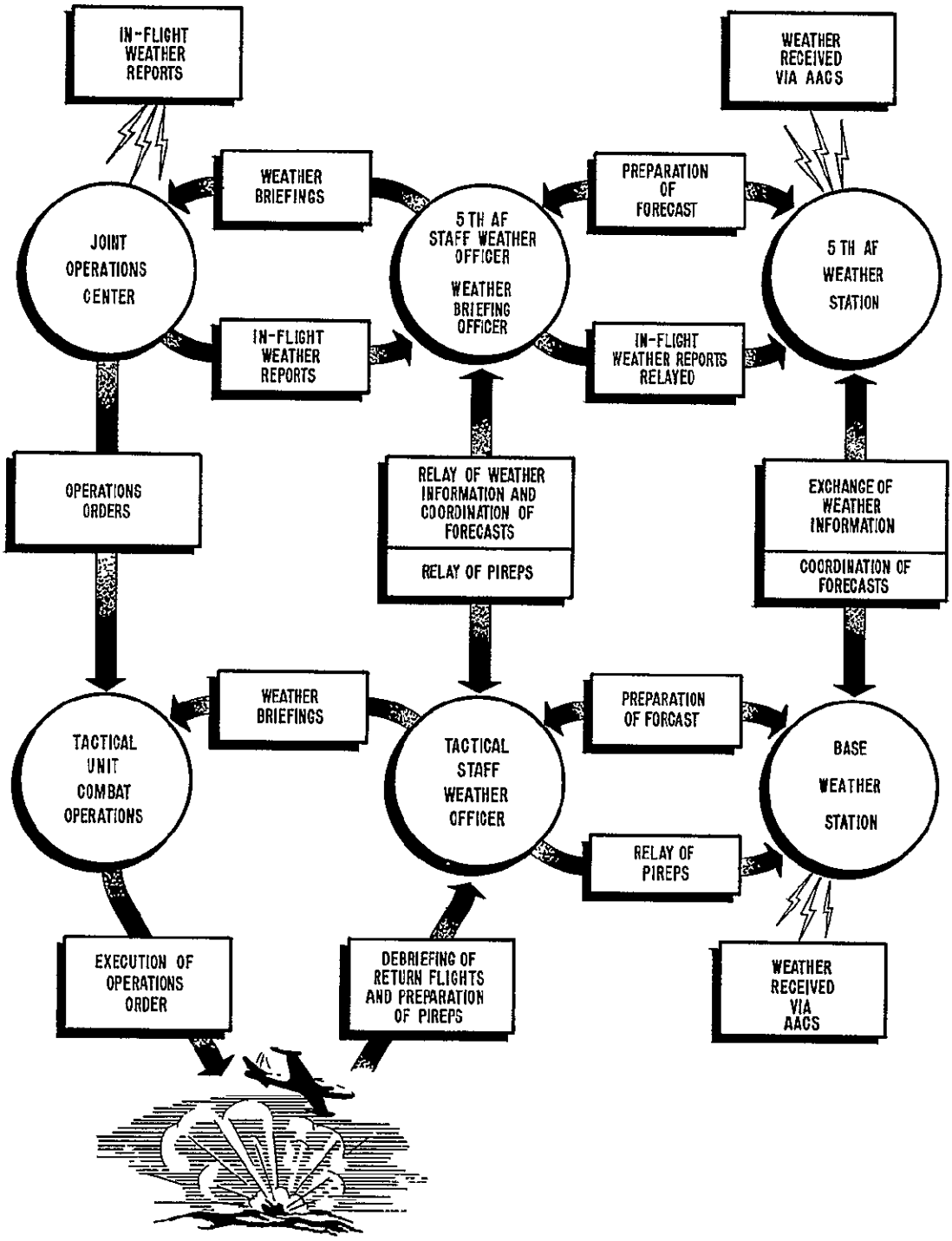


Figure 20

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take-off briefing. Beginning in September a three-way telephone conference was held every night between the Fifth Air Force Weather Station, Tokyo Weather Central, and the FEAF Bomber Command staff weather officer. This conference was designed to eliminate the slightly different forecasts which had been issued by the three agencies.[181] At about 1100 hours the Fifth Air Force Weather Station held another conference with the Tokyo Weather Central, preparatory to the 1300 hours weather summary for JOC planning.[182] Close coordination by the Fifth Air Force Weather Station over the 10 tactical staff weather officers in South Korea—the procedure for which has already been noted—was deemed particularly important. Different forecasts of target weather by 10 staff weather officers would decrease confidence in weather services; moreover, it was to be expected that a staff weather officer might be unconsciously influenced by the wishes of his combat group. That the Fifth Air Force Weather Station served as a coordinating center for Korea did not mean that it was arbitrarily and authoritatively defining weather for all using agencies in Fifth Air Force and Eighth Army. Instead, as has been noted and as is illustrated in figure 20, the forecasts issued from Seoul actually reflected the thinking of all forecast activities of the 30th Weather Squadron. This coordination, reaching fruition in May 1952, effectively terminated a situation whereby on some occasions as many as three different forecasts had been placed before using units covering the same time and area.[183]

The Eighth Army shared in the weather briefings available to Fifth Air Force, and from time to time General Ridgway received upon his request special 24-hour and 48-hour weather forecasts The Eighth Army, however, professed no need for more specialized information until the winter of 1951–52 when one battalion was rendered ineffective by frostbite casualties resulting from a sudden drop in temperature. The Eighth Army at once began to request additional area coverage concerning cloud cover, temperature, precipitation, wind direction, and wind velocity; almost daily contact was maintained between the Eighth Army G–2 and the Fifth Air Force Weather Station.[184] Eighth Army staff officers considered this service to be adequate, but the 30th Weather Squadron continued a survey of Army weather requirements, culminating in the issuance of recommendations on 8 April 1952. The recommended plan included the establishment of a three-officer forecasting team in the Fifth Air Force Weather Station (subsequently redesignated as the JOC Weather Station) which would tailor forecasts more precisely suited to ground forces needs; the assignment of a staff weather officer to Eighth Army and to each corps; and the stationing of four weather-observer teams, manned by Signal Corps personnel, on each corps front. By October 1952 this plan was substantially approved on an experimental basis, and the following month the necessary Signal Corps personnel arrived from Fort Monmouth, where they had just completed a special six-week weather observer course. These men were given orientation, and two-man teams were sent out to start the surface weather observation net across the Eighth Army front. Teams of one officer and four enlisted men were placed with each corps and with the JOC Weather Station to take observations, to collect, and to disseminate data received from the forward posts. Air Weather Service forecasting teams, comprising one weather officer and three airmen, established themselves with the corps headquarters in mid-December 1952, and two additional forecasters were placed with the JOC Weather Station to develop specific forecasts for the Army As the new system got under way, radio teletype transmissions were unsatisfactory, forcing the corps staff weather officers to rely on weather briefings received by telephone from the JOC Weather Station for current weather and forecasts. There was, however, indication that improved teletype and facsimile equipment would be forthcoming.[185]

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FOOTNOTES

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GLOSSARY OF TERMS

AC&W	Aircraft control and warning
ADC	Air Defense Command
AFB	Air Force base
AFF	Army Field Forces
AFFE	Army Forces Far East
AG	Adjutant General
AGOS	Air-ground operations system
ALO	Air liaison officer
AMC	Air Matériel Command
AMS	Army Map Service
ANCR	Aircraft not combat ready
ANFE	Aircraft not fully equipped
AOCP	Aircraft out of commission parts
APGC	Air Proving Ground Command
API	Armor-piercing incendiary
APIC	Army photo interpretation center
APID	Army photo intelligence detachment
ARDC	Air Research and Development Command
AW	All-weather
AWS	Air Weather Service
BDA	Bomb damage assessment
C/	Chief
CAS	Close air support
CAP	Combat air patrol
CCAF	Chinese Communist Air Force
CCF	Chinese Communist Forces
CCRAK	Covert, Clandestine and Related Activities in Korea
CCTS	Combat crew training school
CEP	Circular error probable
CIA	Central Intelligence Agency
CINCFE	Commander-in-Chief Far East
CINCPAC	Commander-in-Chief Pacific
CINCUNC	Commander-in-Chief United Nations Command
CNO	Chief of Naval Operations
COMNAVFE	Commander Naval Forces Far East
C/S	Chief of Staff
CVE	Naval escort aircraft carrier
CW	Continuous wave
D/	Director
DA	Department of Army
DEPTAR	Department of Army
DC/S	Deputy chief of staff
DIR	Disassembly, inspection, and repair
DIS	Daily intelligence summary
DZ	Drop zone
EA	Engineer aviation
EADF	Eastern Air Defense Force
EUSAK	Eighth U S Army in Korea
FAC	Forward air controller
FAF	Fifth Air Force
FAFIK	Fifth Air Force in Korea
FEAF	Far East Air Forces
FEAF BC	Far East Air Forces Bomber Command
FEALOGFOR	Far East Air Logistics Force
FEAMCOM	Far East Air Matériel Command
FEC	Far East Command
GCA	Ground controlled approach
GCI	Ground controlled interception
GLO	Ground liaison officer
GP	General purpose
HEAT	High explosive antitank
HVAR	High velocity aircraft rocket
INTSUM	Intelligence summary
JADF	Japan Air Defense Force
JALCO	Joint Airlift Control
JCS	Joint Chiefs of Staff
JOC	Joint Operations Center
JSPOG	Joint Strategic Plans and Operations Group
LOC	Line of communications
LST	Landing ship tank
MAE	Medical air evacuation
MATCOM	Military Air Traffic Control
MATS	Military Air Transport Service
MAW	Marine air wing
MLR	Main line of resistance
M&S	Maintenance and supply
MSR	Main supply route
NAVFE	Naval Forces Far East
NKAF	North Korean Air Force
NKPA	North Korean Peoples' Army
OAO	Operations Analysis Office
ORO	Operations Research Office
PIREPS	Pilot reports
POE	Port of embarkation
POW	Prisoner of war
PSP	Pierced steel plank
RAAF	Royal Australian Air Force
REMCO	Rear echelon maintenance combined operation
RHAF	Royal Hellenic Air Force
RIO	Reporting in and out
ROK	Republic of Korea
ROKAF	Republic of Korea Air Force
R&R	Rest and recreation
RTAF	Royal Thai Air Force

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SAAF	South African Air Force
SAC	Strategic Air Command
SCAP	Supreme Commander Allied Powers
SCAR	Subcaliber aircraft rocket
TAC	Tactical Air Command
TACC	Tactical Air Control Center
TACP	Tactical Air Control Party
TADC	Tactical Air Direction Center
TADP	Tactical Air Direction Post
TC	Troop carrier
TD	Table of Distribution
TF	Task force
TG	Task group
TIG	The Inspector General
TIS	Translator and Interpreter Service
TMC	Transport Movement Control
T/O&E	Table of Organization and Equipment
UTM	Universal transverse mercator
UN	United Nations
UNC	United Nations Command
UR	Unsatisfactory report
USAFE	United States Air Forces in Europe
V/C	Vice Commander
VHF	Very high frequency
VT	Proximity fuze
WADC	Wright Air Development Center

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