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# UNITED STATES AIR FORCE OPERATIONS IN THE KOREAN CONFLICT

1 July 1952—27 July 1953

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UNCLASSIFIED

1 JULY 1956

Prepared by  
USAF Historical Division  
Research Studies Institute  
Air University  
1956

DEPARTMENT OF THE AIR FORCE

SCANNED BY ISA

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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 and to AHS-72, U. S. Air Force Operations in the Korean Conflict, 1 November 1950-30 June 1952. Each of these monographs is conceived to be an operational history, and no more consideration is given to administrative and logistical problems than is necessary to understand the employment of air units in combat. Each of these monographs is also designed to take the nature of a reference history which must record a multitude of detail in order to cover the spectrum of air operations. As reference histories, these monographs (although considered to be readable) are not designed for "popular" reading. Having completed these three basic monographs, the USAF Historical Division expects to use them as sources for the preparation of an unclassified history which, upon publication, will offer to military readers and to the public the story of USAF operations in the Korean war.

In general, AHS-127 is the history of the last year of USAF operations in Korea, and it records the significant story of the utilization of an air pressure strategy to attain United Nations and United States political objectives in Korea after other forms of military pressure had been tried and had failed to attain these objectives. How this successful air strategy—which pioneered beyond the scope of then current USAF doctrines—was planned and implemented is the central theme of the monograph.

In the preparation of this monograph principal 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 Forces Bomber Command (Provisional), the Far East Air Logistics Force, and the 315th Air Division (Combat Cargo). These historical reports are accompanied by selected supporting documents, which generally prove to be of especial value. In the two earlier monographs in this Korean series, great use was made of wing, group, and squadron histories which, prior to 1 July 1952, were submitted on a monthly basis. Effective on 1 July 1952, however, a change in the Air Force historical regulation permitted tactical wings to prepare and submit a single consolidated semi-annual history. Written some six months after the events described had taken place, often by an officer or an airman who was newly arrived in the theater, these consolidated semi-annual wing histories unfortunately lacked the authenticity and operational detail which was found in the current reporting of the former monthly historical reports. Although some of the semi-annual wing histories were good, none of them provided the rich file of operating level information which was had from the formerly monthly wing, group, and squadron histories. In addition to these historical materials, many reports on special subjects were found in the Air University Library and in the files of the Evaluation Staff, Air War College. Extensive use was also made of the definitive FEAF Report on the Korean war which was issued in two volumes in 1954.

As is the case in all historical monographs, only a small part of the vast store of information included in the command and wing histories of the FEAF could be incorporated in this study. All of these histories, 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. It must be emphasized that these historical materials can furnish much information of value to most agencies of the USAF which have 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 several commands within the USAF, 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.

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## Chapter I

## FACTORS INFLUENCING AN AIR STRATEGY IN KOREA

In mid-1952 the forces of the United Nations Command stood at the threshold of the third and decisive year of Korean hostilities. This would be the year in which the United Nations Command abandoned its old predilections for a ground strategy and utilized air power for the successful achievement of its objectives. The role that air power had played and was to play in Korea is understandable only when viewed in relation to the

United Nations objectives and policies relative to Korea, the strategic concepts of the United Nations Command (UNC), and the organization, capabilities, and relationships of UNC forces in the Far East, for these were the factors which had to be recognized, modified, changed, or sublimated as Far East Air Forces leaders planned and implemented the air strategy which was to be triumphant in Korea.\*

## UNITED NATIONS OBJECTIVES AND POLICIES

After November 1947, when its General Assembly established a commission to supervise the creation of a popularly responsible central government in Korea, at which time both Soviet and American troops were supposed to be withdrawn, the United Nations had consistently supported a political objective of Korean unification under a single representative government. The extent to which military power was to be used to secure this unification, however, was uncertain and varied according to the time and situation. During the period immediately prior to the invasion of the Republic of Korea (ROK) by the North Korean People's Army (NKPA) in June 1950, the United Nations and the United States held a political objective of Korean unification but emphasized that they had no military objective toward Korean unification or even for the preservation of the status quo in Korea. In a speech delivered on 12 January 1950, the U. S. Secretary of State, Dean Acheson, publicly stated that the U. S. defense perimeter ran from the Aleutians to Japan through the Ryukyus to the Philippines. Such an announcement informed the world that Korea lay outside the unilateral military cognizance of the United States.<sup>1</sup> U. S. military missions in the Pacific reflected this same decision: following the

withdrawal of U. S. occupation forces from Korea in 1948-1949, the U. S. Far East Command (FEC) had no mission to defend the ROK against aggression; instead, its sole mission, and the mission of its air component, the Far East Air Forces (FEAF), was the defense of the theater area, including Japan, the Ryukyus, the Philippines, the Bonin-Volcano, and the Marianas Islands.<sup>2</sup>

Obviously expecting to profit from the dichotomy of political and military objectives pertinent to Korea, the Communist NKPA invaded the ROK on 25 June 1950.† Informed of the undoubted fact of Communist aggression against South Korea, the United Nations Security Council on 25 June (26 June in the Far East) ordered a cease-fire in Korea, withdrawal of North Korean forces to the 38th parallel, and called upon all member nations to support the ROK and to withhold support from the aggressor North Koreans. On 27 June (28 June in the Far East), when it was evident that ROK troops could not

\*This chapter represents a summary of material presented in greater detail when within the time periods of AHS-71, USAF Operations in the Korean Conflict 25 June-1 November 1950 and AHS-72, USAF Operations in the Korean Conflict, 1 November 1950-30 June 1952.

†Because of differences in time zones, a given day in the United States is dated one day prior to the same day in the Far East. Thus 25 June in Korea was 24 June in Washington.

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withstand the aggression, the Security Council recommended 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."<sup>3</sup>

The United Nations had now stated a military objective toward Korea and President Harry S. Truman, late on the evening of 26 June (27 June in Japan), directed General of the Army Douglas MacArthur, commanding the FEC,\* to support the ROK. Since the United Nations military objective apparently contemplated no more than the repulse of the Reds from South Korea, the U. S. Joint Chiefs of Staff directed that FEAF would limit its air attacks to hostile forces found south of the 38th parallel.<sup>4</sup> This severe restriction continued until 29 June, when Lt. Gen. George E. Stratemeyer, the commander of FEAF who had just returned from witnessing the disintegration of ROK forces in Korea, protested personally to General MacArthur in Tokyo that any effective air attack had to include targets in North Korea.<sup>5</sup> Acting on his own authority, General MacArthur verbally approved air attacks against North Korean targets, and on 29 June (30 June in the Far East) the JCS confirmed the action: "You are authorized," it informed MacArthur, "to extend your operations into Northern Korea against air bases, depots, tank farms, troop columns and other such purely military targets, if and when, in your judgment, this becomes essential for the performance of your mission."<sup>6</sup> Already on the afternoon of 29 June FEAF had begun to attack military targets in North Korea,<sup>7</sup> but this confusion had cost three critical days in which the NKPA had got its assault into full momentum.

The statement of the limited military objective toward Korea was not soon changed. On 30 June 1950, moreover, the U. S. Department of State, noting that the United Nations political and military objectives were distinct and separate, advised General MacArthur to make it clear that the U. S. military effort in Korea was intended solely to restore the ROK to its territorial status as of 25 June 1950.<sup>8</sup> Still there was some indecision in many minds as to whether the UNC was going to enter and pacify North Korea, and this indecision

\*The FEC was additionally designated as the United Nations Command pursuant to a Security Council resolution of 7 July 1950 which requested the United States to establish a unified command in Korea and to designate a commander for the force.

greatly complicated the task of FEAF air planners who desired to balance the destruction of hostile industrial targets against some knowledge as to whether such plants were going to have to be rebuilt during a UNC occupation.<sup>9</sup> Although FEAF sought a clarification of the United Nations military objective, the problem was not resolved until ground troops of the United Nations Command (UNC) were poised at the 38th parallel. On 7 October 1950, the United Nations General Assembly recommended that: "All appropriate steps be taken to insure conditions of stability throughout Korea," and directed the conduct of elections and the establishment of a "unified, independent and democratic government in the Sovereign State of Korea."<sup>10</sup> This resolution signified that the United Nations political objective of Korean unification was to be achieved through an expanded military objective which now was to liberate, occupy, and unify all of Korea.

The United Nations political and military objectives in Korea remained synonymous until late November 1950 when outright intervention of superior numbers of Chinese Communist ground forces necessitated a reassessment of the military objective. In view of the gravity of the situation, the JCS informed MacArthur on 3 December 1950 that preservation of the safety of the UNC forces in Korea was to be his primary consideration.<sup>11</sup> On 9 January 1951, the JCS instructed MacArthur to conduct a ground defense from successive positions and to inflict such damage on the Communists as was possible, subject always to the safety of the forces under his command.<sup>12</sup> During the cataclysmic month of December 1950 the JCS were aware that any attempt to achieve the political objective of Korean unification solely by military means would be to incur the grave risk of an Asiatic or general world war, either prospect being equally repugnant to the United States and to the other nations supporting the UNC in Korea. The most feasible solution to the Korean war would be to secure a cease-fire agreement, during which the United Nations could proceed with the political, military, and economic stabilization of the ROK, while continuing to seek to accomplish an independent and unified Korea by political actions.<sup>13</sup> To this end the United States sponsored and the United Nations General Assembly on 14 December 1950 adopted a resolution proposing that immediate steps be taken to end

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the fighting in Korea and to settle the existing issues there by peaceful means. When no cease-fire agreement was acceptable to Communist China, the General Assembly on 1 February 1951 declared the People's Republic of China to be in aggression in Korea and affirmed the determination of the United Nations to meet the aggression. It also reaffirmed and continued the policy whereby the United Nations sought to bring about a cessation of hostilities and then to achieve the political unity of Korea by peaceful means.<sup>14</sup>

After December 1950 the United Nations political objective continued to visualize a united Korea, but the military objective required no more of the UNC than the conduct of such operations, consistent with the security of its forces, as would inflict maximum cumulative damages on the Communist armed forces, thereby compelling Communist China and North Korea to seek a military armistice. Whether this military objective was insufficiently spelled out for General MacArthur, or whether he was so fundamentally lacking in sympathy for the directive that he could not grasp it, cannot be determined, but General MacArthur later testified that he was "operating . . . in a vacuum" and, although aware that his directives had somehow been changed, was informed only that his military objective was the security of his forces and the protection of Japan.<sup>15</sup> In the spring of 1951 General MacArthur was critical as to the ultimate expectations of the "accordion fashion" fighting in Korea and noted in one letter subsequently released to the press that: "There is no substitute for victory."<sup>16</sup> Believing it evident that General MacArthur did not agree with U. S. policy in Korea, President Truman relieved him from command on 10 April 1951. To the American people President Truman explained that the U. S. military objective in Korea was "to repel attack . . . to restore peace [and] . . . to avoid the spread of the conflict."<sup>17</sup>

Shortly after he assumed command of the UNC/FEC, Lt. Gen. Matthew B. Ridgway announced to his subordinates that: "Our principal objective is to keep the United States out of war and in Korea to restore international peace and security and to repel aggressions. The job of unifying all Korea, while desirable, is not an element of this principal mission."<sup>18</sup> Under the terms of a codification of extant directives furnished by the JCS on 10 July 1951, the UNC was

charged with the over-all mission "to assist the ROK in repelling the armed aggression against ROK and to restore international peace and security in Korea." The Commander in Chief, United Nations Command (CINCUNC), was specifically charged, consistent with the security of forces under his command, to inflict the maximum personnel and materiel losses on the forces of North Korea and Communist China operating within Korea and its adjacent waters. The policy objective of this military mission was to create conditions favorable to the settlement of the Korean conflict which would, as a minimum, (1) terminate hostilities under appropriate armistice arrangements, (2) establish ROK authority over all Korea south of a northern border so located as to facilitate to the maximum extent both administration and military defense, but in no case south of the 38th parallel, (3) provide for the withdrawal of non-Korean armed forces from Korea in appropriate stages, and (4) permit the building of sufficient ROK military power to deter or repel a renewed North Korean aggression.<sup>19</sup>

From the beginning of Korean hostilities the United States and other members of the United Nations who extended support to the Republic of Korea held firmly to a basic policy that the local Korean war must not be allowed to spread. "The whole effort of our policy is to prevent war and not have it occur," stated Secretary Acheson; "our allies," he added, "believe this just as much as we believe it, and their immediate danger is much greater than ours because if general war broke out they would be in a most exposed and dangerous position."<sup>20</sup> Opposition to any extension of Korean hostilities was very determined in Great Britain, second-most important contributor to the UNC; thus Prime Minister Clement R. Atlee stated flatly: "Our view had always been that the Far Eastern war should be confined to Korea and that it would be a great mistake to have large forces committed to a major campaign in Asia."<sup>21</sup> The determination of the U. S. Government to limit hostilities to Korea was motivated both by humanitarian motives and by sound military reasoning. In the years following World War II the retaliatory power of the United States Air Force, most particularly of its Strategic Air Command, had been the major deterrent to the forces of aggressive international Communism as represented by the Soviet Union, and, as General Hoyt

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S. Vandenberg, USAF chief of staff, explained it, the United States possessed an air capability sufficient to destroy Manchuria and China if it so desired but in doing so the air capability was bound to be attrited and might in fact lose so much of its power that it could no longer deter Russia from overt aggression.<sup>22</sup>

This United Nations policy of limiting military operations to the territorial confines of Korea necessarily restricted the effectiveness of UNC military operations within Korea. Communist forces in Korea were accorded privileged rear areas for assembling and equipping, and the sources of Red war materiel in China and Russia were free from attack. Statement and reiteration of this policy by United Nations spokesmen permitted the Communist powers (who remained enigmatic as to what they intended to do) to make decisions based on a foreknowledge that their homelands would be safe from retaliation. The policy was also productive of a multitude of politico-military restrictions upon military operations within Korea, restrictions which General of the Army George C. Marshall, U. S. Secretary of Defense, said were the result of "an intermingling . . . of political necessities along with military directions." Stated by the Joint Chiefs of Staff after discussions in the National Security Council, these restrictions were framed not only in terms of United States security but "in order to avoid

a break with our allies and a complete confusion in our relations to the United Nations."<sup>23</sup>

One grouping of these politico-military restrictions was designed to prevent aerial violation of China's Manchurian and the USSR's Siberian borders. Although the JCS finally allowed UNC aircraft to approach as near as needful to the Manchurian border, it continued to prohibit air or naval operations within 12 miles of Soviet territory on the Asiatic mainland.<sup>24</sup> A second category of politico-military restrictions was not precisely defined but was manifest most usually by consistent JCS disapproval of suggested operations. The JCS, for example, did not sanction "indiscriminate use" of incendiary weapons.<sup>25</sup> Moreover, the JCS generally disapproved massed air attacks which might be interpreted to be against the North Korean civilian population.<sup>26</sup> The JCS specifically forbade attacks against "hydroelectric installations on the Yalu River."<sup>27</sup> Viewed in their full extent, the politico-military restrictions not only positively limited UNC operations, but they lent an uncertainty to planning at every level. The knowledge that certain targets were "sensitive" and that certain air techniques possessed "far reaching political implications" compelled the CINCUNC constantly to seek decisions from Washington authorities, who not infrequently had to coordinate their answers with the allied powers.

#### STRATEGIC CONCEPTS OF THE UNITED NATIONS COMMAND

In some measure the politico-military restrictions dictated against any reliance upon an air strategy in Korea, but it would also appear that neither General MacArthur nor General Ridgway ever doubted that their army force was the decisive force and that the ground mission was the decisive mission. As received from CINCUNC, the FEAF mission (which remained unchanged until June 1952) revealed the opinion that UNC ground forces were decisive: FEAF was required to: "Conduct air operations as a part of the United Nations Command, to assist in the destruction of North Korean forces."<sup>28</sup> "Your mission," Ridgway informed the Eighth Army commander on 22 April 1951, "is to repel aggression against so much of the territory . . . of the Republic of Korea, as you now occupy. 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."<sup>29</sup> Ridgway simultaneously ordered the FEAF commander to "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." In these sections of the FEAF mission which dealt with Korea, Ridgway thus indicated that the FEAF was to play a supporting role to the Eighth Army.<sup>30</sup> As late as July 1952 a FEAF staff officer had occasion to request that subordinate UNC units should be "made aware [that] 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" in order to "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."<sup>31</sup>

Following the disastrous defeat of the Communist ground armies by UNC air-ground action in the spring of 1951, Lt. Gen. O. P. Weyland, who had assumed command of the FEAF on 10 June 1951, informed General Vandenberg that FEAF now had "its first real opportunity to prove the efficacy of air power in more than a supporting role."<sup>32</sup> At the beginning of the truce negotiations at Kaesong on 10 July 1951, the Air Force did indeed possess an opportunity clearly to demonstrate the innumerable advantages of air power as a predominant weapon. Unlike ground forces, which are always bound to action along a narrow, one-dimensional, surface line of action, and now in July 1951 were limited by directive to an active defense of currently held positions, the Air Force could range far and wide over hostile Korea and by selective attack motivate the enemy to accept such UNC terms as were offered at the conference table.

Unfortunately, however, FEAF was not going to be permitted to exercise these decisive attributes of air power for some while. Taking into consideration the climate of world opinion and the viewpoints of the nations which were furnishing troops to the UNC, the JCS stated the rule that: "If Armistice discussions fail, it is of the greatest importance that clear responsibility for failure rest upon the Communists."<sup>33</sup> In July 1951 when General Weyland proposed to employ a maximum number of medium and fighter-bombers against pinpoint military targets in Pyongyang, after first having warned the civilian population of the impending attack, the JCS disapproved of such an attack in the manner suggested because, it said, "to single out Pyongyang as the target for an all-out strike during the time we are holding conferences might in the eyes of the world appear as an attempt to break off negotiations."<sup>34</sup> That same month, General Ridgway suggested to the JCS that the dispatch of the 116th Fighter-Bomber Wing to the Far East as scheduled might be "ill-advised," since Communist propaganda might con-

strue this to be an indication that the United States was preparing for war while seeking to conclude an armistice. Ridgway was willing to postpone the deployment of the badly needed wing until "the course armistice negotiations may take shall have become clear," but the JCS sent the wing as scheduled, deliberately publicizing its transfer as an augmentation of Japan air defense.<sup>35</sup> One FEAF officer noted that the policy was: "Don't employ air power so the enemy will get mad and won't sign the armistice."<sup>36</sup>

Instead of being allowed a decisive role which would speed the truce negotiations, FEAF was once again cast in a supporting part to the stalemated Eighth Army. Even before the negotiators sat down at Kaesong, General Ridgway was gravely concerned by intelligence reports which said that the Communists were diligently increasing their offensive capabilities.<sup>37</sup> On 6 July he informed the JCS that numerous reports "indicate a planned large scale offensive effort to be launched in the event . . . peace overtures fail."<sup>38</sup> In August he reported that the enemy was "capable of launching limited attacks to gain local advantages and of expanding such piecemeal efforts rapidly into a general offensive at a time suiting his purpose."<sup>39</sup> These estimates that the Communist armies had not recognized their defeat but were instead utilizing the truce negotiations as a respite in which to prepare for another offensive were completely accepted by the UNC staff and "deeply concerned" the JCS.<sup>40</sup> The result was that UNC air power, beginning on 18 August 1951 and continuously thereafter, was employed in a comprehensive rail interdiction campaign 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."<sup>41</sup> A few over-enthusiastic air officers—someone tagged this operation with the name of STRANGLE—believed that these interdiction operations might so seriously deplete hostile logistics as to force an enemy retreat, but a more considered viewpoint was that no better employment for UNC air was available under the existing policies. The real significance was that UNC air forces were again supporting UNC ground forces—although these ground forces were stalemated—and that these interdiction

efforts were not going to provide sufficient pressure to compel the enemy to accept the UNC terms for an armistice.

From the time that truce negotiations were first proposed by the Soviet delegate to the United Nations, the Communists evidently determined to seize every advantage which could be wrung from such discussions. When CINCUNC proposed on 30 June that the cease-fire talks be held aboard a hospital ship in Wonsan harbor, the Communists instead suggested that they take place at Kaesong, an ancient Korean town lying northwest of Seoul and just south of the 38th parallel. Designation of this site was a shrewd stroke which not only allowed the Reds to realize the psychological advantage of meeting on South Korean soil but also created a neutral zone—called the HOLY LAND—around Kaesong which greatly hampered UNC air and ground operations at the western end of the battle line. Although CINCUNC accepted the Kaesong site, he later noted that it was the “first harbinger of Communist delay.”<sup>42</sup> As the talks got underway the UNC delegation was under instructions to demonstrate an attitude “characterized by calmness, firmness, patience,”<sup>43</sup> but the Communist delegates soon showed that they were neither the usual diplomats nor gentlemen. In short, Ridgway soon said that the Red delegates were “treacherous savages.”<sup>44</sup> In negotiating, the Communist delegates displayed an utter timelessness which if “not consistently dilatory” was “demonstrably obstructive and stubborn.”<sup>45</sup> When they gained an inkling of concessions decided on or even being considered by the United Nations, or knowledge that some new course of action not necessarily a concession was up for decision, they became obdurate and unwilling to negotiate.<sup>46\*</sup>

Initially the Reds delayed the adoption of an agenda by a stubborn insistence that the proposed settlement should comprehend political matters. Finally on 26 July the UNC delegation conceded that the cease-fire instrument could make recommendations for the consideration of a subsequent political conference, and the Communists agreed to the agenda, containing the following five items: (1) adoption of an agenda, (2) establishment of a military demarcation line and demilitarized zone, (3) concrete arrangements for a cease-fire, (4) disposition of prisoners of war, and (5) recom-

mendations to governments concerned of matters for settlement at a political conference.<sup>47</sup>

When discussions of the demarcation line began on 26 July the Communists were adamant that the line should be drawn at the old 38th parallel, and the UNC delegates insisted just as firmly that the line would have to conform to the military realities of the existing battle line. Finally on 18 August the UNC proposed and the Communists agreed to let a subcommittee discuss the deadlocked matter. While these discussions had been going on the Communists had been consolidating their control of the area around Kaesong, so that what had initially been a no-man's land became a Red stronghold. On 4 August the Reds brazenly marched armed troops through the neutral zone. The UNC delegates at first mistrusted this bravado but took no action. On 23 August, however, the Communists, having manufactured an incident whereby they claimed that a UNC plane had bombed Kaesong, broke off the sub-delegation talks. Armistice talks were not resumed until 25 October and then at Panmunjom, a site which the UNC had selected as being adjacent to the actual lines of military contact. Here the Communists finally agreed to accept the existing point of ground contact as the demarcation line and then quickly sought to get agreement on a de facto cease fire, an arrangement which would obviously have permitted them to reinforce their troops without hindrance during the remainder of the armistice negotiations. By way of a compromise, the UNC proposed that, beginning on 27 November, the then existing battle line would become the effective demarcation line in any agreement reached within 30 days. This compromise was accepted by the Reds, and for a few weeks it appeared that a cease-fire agreement might be near.

But the truce talks were not going to be concluded by 27 December for, having failed to secure quick agreement on the essentially simple matter of a demarcation line, the negotiations relative to the more complex agenda items became a wrangle. On 27 November the main armistice delegations began discussion of the third item of the agenda. The UNC delegation urged that a neutral nations supervisory organization be established for the supervision of armistice terms and that it should

\*See Adm. C. Turner Joy, *How Communists Negotiate* (New York: The MacMillan Company, 1955.)



have inspection access to all of Korea, that the military forces to be maintained in Korea during the armistice would not exceed in number those there at the cessation of hostilities, and that a definite restriction be imposed against the construction or rehabilitation of airfields during the armistice. A subcommittee began consideration of these thorny problems on 4 December, and it worked out a broad agreement on all proposals except that concerning airfields, which the Reds stoutly maintained they were going to build and rehabilitate during the armistice. Discussion of other details, including troop rotation, ports of entry, and the membership of the neutral nations inspection team prolonged negotiations on this agenda item into the spring of 1952. During April no progress was made: the Communists insisted that the USSR would be one of the neutral nations and declared that they would accept no denial of a right to construct airfields during the armistice. Discussion of the fourth agenda item, which related to the disposition of prisoners of war, had deadlocked even earlier. This item had been introduced on 11 December 1951, and on 1 January 1952 the UNC delegation proposed an all-for-all exchange, with the prisoners of war to be permitted freedom of choice to accept or reject repatriation. Although some information was obtained by the UNC relative to the names of POW's held by the Communists and the location of POW camps, no material progress was made on this item.

By April 1952, it was increasingly apparent that the armistice negotiations were approaching a complete deadlock. At a plenary session of the main armistice delegations on 28 April 1952 the UNC chief delegate therefore made a package proposal incorporating equitable solutions to the three outstanding problems. The UNC was willing to concede on the airfield question and to agree that the armistice document would make no reference to reconstruction or rehabilitation of airfields during the armistice. Holding that membership on the neutral nations supervisory teams had to be mutually acceptable to both sides, the UNC was unwilling to accept the USSR as a neutral nation, but it announced that it would accept Poland and Czechoslovakia provided the Reds would accept Sweden and Switzerland. Finally, the UNC proposed that the basis for the exchange of prisoners of war would be equitable, reflecting the principle of no forced repatriation. At another executive

session on 2 May the Communists formally rejected the UNC solutions, proposing instead that they would withdraw the name of the USSR provided the UNC would withdraw its objection to the rehabilitation of airfields and agree to a compulsory repatriation of prisoners of war. While careful not to break off the negotiations, the senior UNC delegate summarily rejected the Communist proposal, announcing that the UNC position was now "clear, final, and irrevocable." A little later on, the senior Communist delegate, Lt. Gen. Nam Il, announced that his side was just as adamant as was the UNC: "Our side," he said, "absolutely cannot consider under whatever circumstances any proposal of the so-called no-forced repatriation which would detain war prisoners. No matter what your side should do inside or outside of the conference, the Korean People's Army and the Chinese People's Volunteers will fight to the very end for the return of every single war prisoner."<sup>48</sup>

As the truce talks dragged on, General Weyland and his staff became increasingly impatient to be allowed to strike more decisive target systems. Early in January 1952, General Ridgway recognized that the Reds were stockpiling supplies by the accretion of small amounts in excess of closely regulated expenditures. He nevertheless warned the JCS that: "If the interdiction program should be discontinued or reduced, the enemy could, within a relatively short period of time, be capable of accumulating sufficient supplies to permit him to launch and sustain a major offensive."<sup>49</sup> On 5 January 1952, Brig. Gen. James Ferguson, vice commander of the Fifth Air Force, requested authority to attack the North Korean hydroelectric installations. General Weyland recommended that the destruction of this complex would "accomplish immediate as well as long range military effects against the enemy, and would additionally create significant psychological and political effects to our advantage."<sup>50</sup> When the request to attack the hydroelectric plants came to him on 3 March 1952, however, General Ridgway refused to approve it but agreed that: "In the event that a decision is reached that the Communists are deliberately delaying armistice negotiations indefinitely and are increasing their offensive capabilities, your recommendations will be reexamined." In the event that negotiations were broken off or hopelessly deadlocked, Ridgway indicated that he would like to coordinate these hydroelectric at-

tacks with other military operations in a renewed Korean ground campaign.<sup>51</sup> That same month General Ridgway was preparing plans to loose the Eighth Army from its operational restrictions if the Communists broke off the talks, but he informed the JCS that he still had faith in the eventual success of the negotiations provided the United States stood inflexibly on major issues. He said that he was not ready for the last resort, which was "to apply the one influence which the Communists the world over recognize, and that is force."<sup>52</sup>

By the end of April 1952 FEAF planners had prepared the outlines of an air strategy which they believed would bring sufficient pressure to bear on the Communist enemy to force him to accept the UNC armistice terms.\* On 28 April the UNC made its "final" offer of peace terms to the Communists. And on 29 April 1952, President Truman announced General Ridgway's relief for other duty and the appointment of General Mark W. Clark to be CINCUNC/CINCFE. General Clark, who had commanded the U. S. Fifth Army in Italy during World War II and had lately served as chief of Army Field Forces, assumed command in the Far East on 12 May 1952.<sup>53</sup> General Clark had seen Communism at first hand when he had commanded American occupation forces in Austria, and he firmly believed that "only through forceful action could the Communists be made to agree to an armistice the United States considered honorable." To each of his subordinate commanders, he posed the question: "What can I do militarily and otherwise to make the Communists realize that the price of peace is not as cheap as they are trying to make it?"<sup>54</sup>

As General Weyland expressed it, "A significant change in combat operations policy took place in May." Interdiction operations were expanded to include destruction of important targets, target complexes, and target systems.<sup>55</sup> Announced in mid-June was a new and imaginative air mission directive: "The primary missions of the Far East Air Forces are to maintain by air action in Korea maximum military pressure on enemy forces, to provide general air support for the United Nations forces in Korea, and to be prepared to carry out Far East Air Forces tasks in the event of a general emergency."<sup>56</sup>

\*See Chap. II, pp. 24-27.

While General Clark approved the FEAF plans to lay intolerable air pressure upon the Communist enemy in North Korea, he nevertheless had some expectation that Eighth Army ground pressure might also prod the balky Reds. In July, Clark approved an Eighth Army plan BUCKSHOT for a battalion-sized raid against enemy positions west of the Nam River; but when the ROK battalion suffered more casualties than it inflicted on the enemy, Clark would not approve the Eighth Army's request to repeat such actions.<sup>57</sup> Again the Eighth Army commander urged that offensive employment was needed to keep the enemy on the defensive, to capture advantageous terrain, and to maintain combat efficiency, and General Clark approved operation SHOWDOWN, a two-battalion limited objective attack designed to seize Triangle Hill and Sniper Ridge, northeast of Kumhwa in the IX Corps area, on the night of 13/14 October. This attack, mounted as scheduled by one battalion each of the U. S. 7th and ROK 2d Divisions, successfully secured its objectives, but determined enemy counterattacks inflicted heavy UNC casualties and eventually recaptured Triangle Hill. When the Eighth Army proposed additional localized attacks in November, General Clark stated firmly: "We should not unless absolutely necessary initiate another action which may be a repetition of the bloody battle for Triangle Hill and Sniper Ridge."<sup>58</sup> After October the Eighth Army undertook no more offensives against the Communist ground forces: an accumulation of evidence had convinced the JCS and the CINCUNC that such ground offensives were fruitless.

On 8 August the JCS directed Clark to put forth no new proposals at the armistice talks but to "continue, within existing directives, to make maximum practicable use of available air strength in attacks upon all military targets in North Korea."<sup>59</sup> Later in August General Clark stated his full agreement that maximum pressure should be maintained upon the Communists: "The capability for such pressure, without unacceptable cost," Clark noted, "lies in the air arm."<sup>60</sup> Between April and September 1952 the armistice negotiations had remained stalled upon the sole issue of the disposition of anti-Communist POW's. Finally, on 25 September, President Truman approved the JCS recommendations in favor of an indefinite recess in the negotiations. When the

negotiations were recessed, the JCS instructed, CINCUNC would "maintain unrelenting military pressure on the enemy, particularly through air action."<sup>61</sup> As it had been instructed to do, the UNC armistice delegation on 28 September recapitulated the UNC positions on repatriation and then recessed plenary sessions until 8 October. When, on this latter date, the Communists were unwilling to accept the UNC proposals, Lt. Gen. W. K. Harrison, senior UNC delegate,\* announced that the UNC was thenceforth recessing, not terminating, the plenary armistice sessions. At such time as the Communists were ready to accept one of the UNC proposals, or when the Reds had a constructive proposal of their own, the UNC could be contacted through its liaison officers at Panmunjon.<sup>62</sup>

Anticipating that the Communists would refuse the UNC proposals, the JCS and CINCUNC had been discussing measures to be taken in the event that active hostilities were resumed. General Clark was firmly convinced that the "underlying reason for failure thus far to achieve an armistice is that we have not exerted sufficient military pressure to impose the requirement for an armistice on the enemy." He was nevertheless dubious about any prospects of UNC ground offensive pressure: unless such an offensive could destroy

the superior numbers of the well-entrenched Red ground armies and could carry victory to the Yalu, General Clark did not think a UNC ground offensive could compel the enemy to seek armistice terms. Any achievement short of military victory attained by UNC ground forces "would be purchased at highly unpalatable personnel cost." Such ground offensives, moreover, would be impracticable with currently available UNC ground divisions; and even if he could get these needed ground reinforcements, Clark still noted that he would first prefer to extend the air war to Chinese and Manchurian targets and to implement a naval blockade of China before launching any major UNC ground offensive or committing major ground elements to an amphibious assault.<sup>63</sup> Thus it was recognized in the autumn of 1952 that only the UNC air forces had an ability to exert potent pressure against the Communists in North Korea. General Omar N. Bradley, chairman of the JCS, summed up the situation in November 1952 when he said that UNC air power "constitutes the most potent means, at present available to the United Nations Command, of maintaining the degree of military pressure which might impel the Communists to agree, finally, to acceptable armistice terms."<sup>64</sup>

#### ORGANIZATION OF THE UNITED NATIONS/FAR EAST COMMAND

**Command Relationships:** Viewing air power as a supporting force to Army operations and never doubting that the surface battle was decisive, Generals MacArthur and Ridgway not unnaturally failed to perceive the pressing need for unified controls which would have permitted the maximum exploitation of the air weapon. The lack of such unified controls was quite apparent in the organization of the headquarters of the Far East Command, which, pursuant to the United Nations Security Council resolution of 7 July 1950 requesting the United States to establish a unified command and designate a commander for the United Nations forces in Korea, was simply additionally designated as the United Nations Command, without change in existing organizational structure. This action was accomplished on 24 July 1950.<sup>65</sup>

The command structure of the UNC/FEC was

\*General Harrison relieved V/Adm. C. Turner Joy as senior UNC delegate on 23 May 1952.

shaped as follows: serving the CINCUNC/CINCFE was the Headquarters, UNC/FEC, and under this apex were the Naval Forces Far East (NAVFE) and the Far East Air Forces (FEAF), both being major coequal commands. Official organizational charts showed another headquarters, called "Army Forces Far East," on the major command level, but supposedly for reasons of economy this major Army headquarters had never been activated. Instead the CINCUNC/CINCFE served also as the force commander to Army organizations in the Far East and the Headquarters, UNC/FEC provided the necessary staff work for top-level Army guidance. For this reason, although not properly major commands equivalent to NAVFE and FEAF, the U. S. Eighth Army and for a time during 1950 the U. S. X Corps reported directly to CINCUNC/CINCFE. Under this arrangement the Headquarters, UNC/FEC, was essentially an Army staff, and by no stretch of

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imagination could it be considered a joint staff equally representing Army, Navy, and Air Force components. On 20 August 1949 CINCFE had ordered the establishment of a Joint Strategic Plans and Operations Group (JSPOG) to assist and advise him on matters pertaining to the exercise of unified command over Army, Navy, and Air Force forces allocated to the FEC.<sup>66</sup> Since it comprised three Army officers, three Navy officers, and two Air Force officers, the JSPOG was frequently cited as evidence that the Headquarters, UNC/FEC possessed a joint staff, but it was apparent that this small group could not serve as the joint staff contemplated by the JCS unified command plan.<sup>67</sup> By a similar type of logic, the G-2 Intelligence function of the Headquarters, FEC was reorganized on a "joint basis" in January 1948 by the assignment by 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."<sup>68</sup> Manned primarily by Army personnel and preponderantly concerned with Army business, the Headquarters, FEC was quite naturally "dominated by Army thinking, and prone to honor Army concepts."<sup>69</sup>

The lack of a properly constituted joint UNC/FEC headquarters staff which was capable of advising the CINCUNC/CINCFE was resultant in many interservice problems, many of which have been noted in earlier historical monographs. At least three of these problems were so major as to require especial notice.

In the absence of a joint staff, the Headquarters UNC/FEC proved incapable of giving centralized direction to UNC air effort. Without coordinating with either FEAF or NAVFE, the FEC chief of staff on 14 July 1950 established the GHQ Target Group as a part-time organization, comprising a senior officer from the FEC G-2 section as chairman, an Air Force and a Navy officer from the JSPOG, and a member representing the FEC G-3 section. These four men were charged to select air targets for FEAF and NAVFE, thus coordinating the employment of these two forces, and such targets were transmitted to these forces for attack by an order of the CINCUNC/CINCFE. Unfortunately the GHQ Target Group did not prove to be conversant with problems of air target selection: utilizing faulty maps

(although correct maps were available) and reading errors into these maps, the GHQ Target Group selected some 220 primary and secondary targets, of which some 20 percent did not exist. Thus in August 1950 FEAF aircraft were dispatched to bomb bridges on rail lines which had never been built. To secure a resolution of this difficulty, General Stratemeyer on 22 July 1950 persuaded CINCFE to establish the GHQ Target Selection Committee, consisting of the FEC deputy chief of staff, the FEC G-2, the FEAF vice commander for operations, and a NAVFE representative. This action restored the burden of target identification to qualified analysis functions in FEAF and NAVFE and the GHQ Target Selection Committee limited its activities to the determination of the large scale application of the available air effort.<sup>70</sup> This committee functioned as long as it was needed and eventually went out of business.

No such fortuitous arrangement was ever matured in the FEC theater organization to handle covert and clandestine activities, a function which vitally concerned the lives of airmen forced down in enemy territory. By JCS directive of 18 August 1951 CINCFE was authorized to exercise direct command of the conduct of covert operations in direct support of combat operations in which his forces were engaged. Without formal coordination, CINCFE 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, and CIA [Central Intelligence Agency] operations of this nature . . . in Korea." CCRAK was in theory under direct CINCFE command, but it was supervised by the Assistant Chief of Staff, G-2 FEC. Since this officer was also G-2 for the Army Forces in the Far East, this directive in effect negated the direct command channels of the component force commanders to CINCFE and purportedly established a joint task organization not in consonance with appropriate JCS criteria.<sup>71</sup>

Allocation of transportation space among the FEC commands was a third problem inequitably solved at theater level: as was entirely proper for the most efficient use of a scarce service, air transport space was closely monitored and allocated to using services by theater allocations board; on the other hand, land and sea transport were frequently

critical but space allocations of surface transport were managed by the Japan Logistical Command within Japan and by the Eighth Army in Korea.<sup>72</sup>

"Whenever combinations of Air Force, Army, and Navy are in a joint command," General Weyland had stated in 1950, "it is essential that the Commander-in-Chief have a joint staff with proportionate representation of the services involved."<sup>73</sup> Under Generals MacArthur and Ridgway no reorganization looking toward a joint staff at the UNC/FEC level was effected, but shortly after he took command General Clark announced that his headquarters "should be a joint, tri-service operation, rather than an army project."<sup>74</sup> On 20 August 1952 General Clark therefore made known his intent to organize a small joint FEC headquarters staff, to be composed of appropriate members from each of the three military services in key positions of responsibility. He concurrently intended to establish the long-absent Headquarters, Army Forces Far East (AFFE) on the same major command level with FEAF and NAVFE. On 1 October 1952 AFFE was accordingly activated, with manning provided by the simultaneously inactivated Japan Logistical Command and the Headquarters and Service Command, FEC. Although the functions of these commands, as well as many of the "joint" functions of the old Headquarters, UNC/FEC, were assumed by the new AFFE, it was found that there was a small but real savings in personnel, thus disputing the old assertion that the non-existence of a theater Army headquarters saved personnel.<sup>75</sup>

Although planning got underway in September 1952, the reorganized UNC/FEC Headquarters did not begin to function until 1 January 1953. As a joint organization the new headquarters was staffed by 91 Army officers, 48 Air Force officers, and 43 Navy officers.<sup>76</sup> The new joint staff included a chief of staff, three deputy chiefs of staff representing Army, Navy, and Air Force components, and five J-staff positions: J-1 Personnel, J-2 Intelligence, J-3 Operations, J-4 Supply, and J-5 Civil Affairs. Of these top-level positions, two were authorized to the Air Force: a deputy chief of staff, a position filled by Maj. Gen. Ernest Moore, who came from command of the Thirteenth Air Force to assume the duties, and the J-2 Intelligence position, a job which FEAF subsequently released without filling in order to nomi-

nate an Air Force officer as J-3 Operations. Not until October 1953, however, when Maj. Gen. Elmer J. Rogers assumed the duties, would an Air Force officer serve as J-3 Operations.<sup>77</sup> General Clark was highly enthusiastic concerning his new joint UNC/FEC staff: "all had outstanding records," Clark wrote, "and . . . pulled together in the tri-service team." At the late date of its accomplishment, the top-level reorganization lacked much significance to the Korean war, but as Clark observed: "Had we carried the war to a victorious conclusion it would have required the closest kind of integration of ground, naval, air and amphibious operations. A truly integrated staff of the three services, in which men were picked for their ability rather than the color of their uniforms, is the answer to combined operations."<sup>78</sup> A USAF study of the theater command situation in the Far East was in complete agreement with General Clark: "It becomes increasingly clear," stated this study, "that one branch of the service should never, under any circumstances, be placed under a commander of another branch of the service unless he has a truly joint staff. Although the alternative might temporarily eliminate a few minor problems, the abuses to which it would inevitably lead are so dangerous that it must not be permitted."<sup>79</sup>

The theater headquarters reorganization was a wholesome reform, but as implemented it was less than a complete solution to the theater problems already noted. Stating that his action was necessary in order to give personal direction to the Eighth Army and to avoid the requirement for another Army general in a grade senior to the Commanding General, Eighth Army, General Clark assumed personal command of the new AFFE, announcing that he would normally exercise control through a deputy. Headquarters, AFFE, moreover, was named executive agent for nearly all of the theater functions previously exercised by the old UNC/FEC headquarters, an action which was somewhat less than desirable according to criteria for a unified command. Thus AFFE took over the allocation of surface transportation in Japan previously controlled by the now-deactivated Japan Logistical Command, whereas all surface transportation allocations (as was the case with air transport) might have been more properly managed by a theater transportation board with joint representation of the using service components.<sup>80</sup> Similar disposition was made of CCRAK: at the

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time of the top level reorganization, the commanding general AFFE was designated "Executive Agent for CINCFE/CINCUNC for joint matters pertaining to . . . direction of theater clandestine and covert operations," thus continuing to violate JCS instructions that CINCFE would exercise direct command over these activities. CCRAK continued to emphasize an intelligence gathering function and was supervised by the Assistant Chief of Staff G-2, AFFE. At the end of the Korean conflict not over 15 airmen could attribute their successful evasion to any help accorded them by indigenous personnel in North Korea.<sup>81</sup>

**NAVFE-FEAF Command Relationships:** In Korea the coequality of FEAF and NAVFE in the theater command structure, without joint air and naval representation on the theater headquarters, prevented the maximum application of the available air effort. The greatest utilization of essentially scarce air power in a theater of operations, moreover, requires not only the minimum essential of a joint theater staff but poses a direct requirement that all theater air forces be placed under the command or operational control of a single theater air commander. Receiving tasks and priorities from the theater commander, the theater air commander is able to exercise a centralized control in order to ensure the fullest exploitation of available air power.

Cognizant at the very beginning of the Korean war 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 requested that, with the exception of units used in air-sea warfare, all Navy and Marine land-based and carrier-based aviation when operating over Korea be placed under his operational control. General 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."<sup>82</sup> Instead of granting this clearcut authority, the chief of staff, FEC, directed in a letter bearing a file date of 8 July 1950 that: 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 in execution of missions assigned by CINCFE to NAVFE. When both NAVFE and FEAF were assigned missions in Korea, "coordination control, a Commander-in-Chief, Far East, prerogative," was delegated to commander FEAF.<sup>83</sup>

The precise meaning of this unusual term "coordination control" was never apparent although it would continue to guide the course of air operations during the Korean hostilities. During the first six months of the Korean war, the uncertain meaning of "coordination control" was productive of much unnecessary confusion which might have been fatal to the UNC cause had the enemy been able to make an all-out air attack. Gradually some extemporized order was obtained. Under the terms of the FEC directive, FEAF charged its Fifth Air Force with the direction of tactical air operations and the support of the Eighth Army in Korea, and, after two periods in which it supported the independent U. S. X Corps, the 1st Marine Air Wing—the elements of U. S. Marine Corps aviation in the Far East—was by the end of 1950 clearly operating in an area of Fifth Air Force authority and thus the Joint Operations Center (JOC) in Korea assigned it missions to be flown in exactly the same manner as it assigned missions to Fifth Air Force wings. Coordination control of the carrier-based aircraft of the U. S. Seventh Fleet (Task Force 77) presented more difficult and long enduring problems. In late July and early August 1950 the Eighth Army frequently requested close support from the fast carriers and CINCFE ordered it, often without informing either FEAF or the Fifth Air Force, a procedure which invariably was resultant in confusion when carrier aircraft were launched by the deckload and suddenly appeared over the battle lines, seeking targets from tactical air control parties who had not known they were coming. Beginning in August 1950 an informal Navy liaison section sent to the JOC provided some coordination for Task Force 77 and Fifth Air Force effort, but not until January 1951 was Task Force 77 able to arrange direct radio communications with the JOC, messages having been passed in the meanwhile through NAVFE in Tokyo. Carrier pilots were customarily given a special sector of the front for ground support and specific armed reconnaissance route responsibilities. Having no actual authority over carrier

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air operations, the JOC, however, was nevertheless frequently hard pressed to make up from Fifth Air Force resources many planned supporting air strikes which had been suddenly, often without advance notice, cancelled by Task Force 77. There was, moreover, no real integration of available close-support effort since Navy and USAF aircraft had to operate in separate sectors of the battle line.<sup>84</sup>

When FEAF and NAVFE aircraft were utilized against Korean target systems not directly supporting ground operations, the FEC chief of staff had originally contemplated that the basic selection and priority of target areas would be accomplished by the GHQ Target Group. When this agency had been unable to handle this duty, the responsibility for coordinating targets was taken over by the high-level GHQ Target Selection Committee. This committee met informally for several weeks, passing upon targets recommended to it by the FEC, FEAF, and NAVFE. Only FEAF possessed a target analysis section conversant with Korea, and as a result its target committee, representing its deputies of operations and intelligence, undertook a great portion of FEC air targets development and nomination. Subsequently reorganized to bring in representatives from the FEAF Bomber Command and the Fifth Air Force and designated as the FEAF Formal Target Committee, this agency met every two weeks and made recommendations to the FEAF commander. In effect, if not in actuality, the FEAF Formal Target Committee became the basic theater agency for target selection and the medium through which basic tasks outlined by CINCFE and commander FEAF were translated into planned air campaigns.<sup>85</sup> Although FEAF gradually undertook most of the responsibility for implementing tasks assigned by CINCUNC/CINCFE into air campaigns, FEAF and NAVFE remained coequals. In planning air campaigns, FEAF therefore had to arrange for Seventh Fleet aircraft participation by requesting such through CINCFE, or, when authorized, directly from COMNAVFE. During the first two years of the Korean war naval aircraft were generally given separate areas of attack from those of the FEAF forces. Such arrangements not only vitiated the capabilities of air power when employed in mass, but they also resulted in situations where no single

air commander could be held responsible for the success or failure of the whole air effort.<sup>86</sup>

In the absence of a joint headquarters staff at the FEC level, the fact that no one knowledgeable individual controlled the employment of all available UNC air units was especially critical, but the reorganization of Headquarters, UNC/FEC, while it was of salutary effect, did not in itself secure a unity of air effort since FEAF and NAVFE continued as independent equals in the command structure. Although the new UNC strategy of air pressure demanded the employment of massed air in attacks representing the full force of the UNC air capability, General Clark preferred to obtain such unification of air actions through "team play," and he later stated that "there has been complete team play."<sup>87</sup> Although FEAF-NAVFE cooperation was greatly improved in the last year of Korean hostilities, it would appear that the "team play" was derived from the fortunate personalities of the commanders involved rather than from more certain and stable dictates of command organization. Fundamentally, NAVFE participation in the FEAF-inspired air activity was still obtained on a request basis. Thus in June 1952 when he perceived that the North Korean hydroelectric facilities had to be taken out in a single maximum effort, General Weyland requested and General Clark directed that FEAF and NAVFE forces would be employed against these objectives, with Weyland being designated the "coordinating agent." At the end of the initial series of strikes, FEAF suggested and NAVFE approved a proposition whereby continued surveillance and repeated attacks against the North Korean hydroelectric plants would be coordinated between the Fifth Air Force and the Seventh Fleet at the JOC in Korea.<sup>88</sup> By August 1952 the rapprochement between the Seventh Fleet and Fifth Air Force was sufficiently cordial that FEAF authorized the latter to request naval strike participation in operations where it was necessary, although FEAF would continue to negotiate for assistance from NAVFE when such was advisable.<sup>89</sup> COMNAVFE also directed his subordinate commanders to give advanced notice of independently planned naval air strikes to CINCFE, to commander FEAF, and to himself in order to ensure effective coordination with other air operations which might be scheduled or planned.<sup>90</sup>

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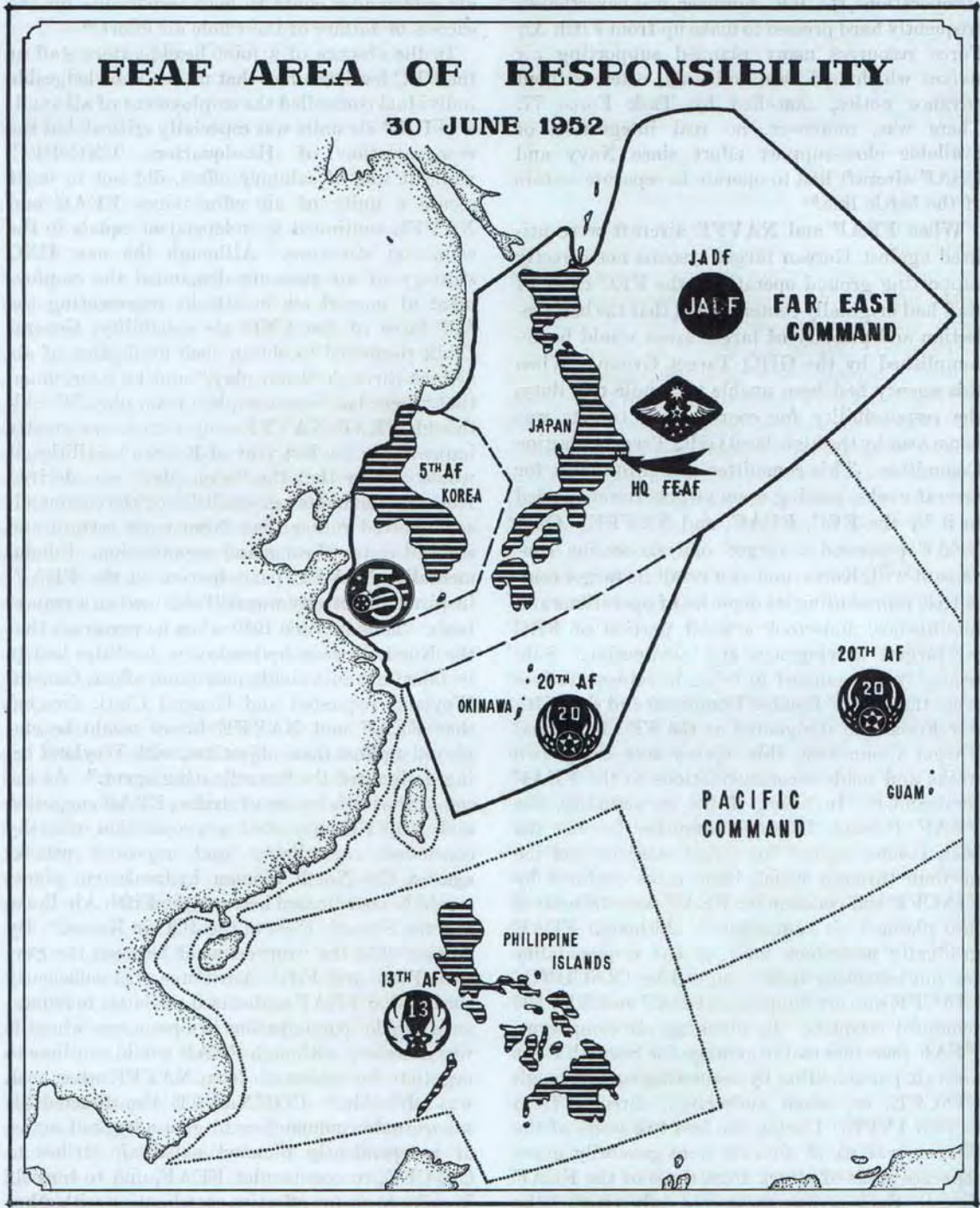


Figure 1.

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Before the end of hostilities the Seventh Fleet and Fifth Air Force locally effected an extremely close coordination of battle line support. Beginning in August 1952 Navy pilots got back into the close-support business and flew an average of 12 ground-support sorties daily for the U. S. X Corps and ROK I Corps at the eastern end of the battle-line. Early in September NAVFE informed FEAF that it would like to provide carrier aircraft support across the entire Eighth Army front whenever such was necessary, a proposition with which FEAF concurred. Such across-the-front close-air-support by carrier aircraft began in September 1952 and continued for the remainder of the war. Beginning on 9 October 1952 and remaining thereafter a major Seventh Fleet activity was "Cherokee" attacks, carrier air strikes against prebriefed general support targets directly behind the bomblines under the control of a Fifth Air Force tactical air coordinator (Mosquito). For the first time, on 23 May 1953, Navy aircraft utilized the MPQ technique\* to blast enemy targets in bad weather, through cloud cover.<sup>91</sup>

Following these months of increasingly intimate cooperation with the Fifth Air Force, the Seventh Fleet in June 1953 agreed to abandon "coordination" in favor of an integral participation in the Korea JOC. At this time the commander Seventh Fleet appointed to the JOC a naval member (NMJ) whose duties were made roughly analogous to those of the Fifth Air Force director of operations. Specifically, the NMJ committed carrier aircraft to integrated tactical air operations and had a positive control of close-air-support effort and the target selection for Cherokee attacks. Commander Task Force 77 provided the NMJ with his air operations intent daily, 24 hours in advance; the NMJ notified the task force commander daily, 12 hours in advance, of the assignment of these airplanes to immediate and pre-

planned missions. The NMJ was assigned the additional duty of senior naval liaison officer with Fifth Air Force, and, as such, operated a naval air operations center which maintained current information concerning the movement of fleet naval aircraft, the location of surface units, and functioned as a local fleet message center.<sup>92</sup> This action was a final step needed to create the centralized control so necessary to successful tactical air operations in support of the Eighth Army in Korea, but as FEAF noted "it came too late to have any real effect on the course of the war."<sup>93</sup>

No such integration of planning and operations as was belatedly obtained through personal agreements between the commanders of the Fifth Air Force and the Seventh Fleet was attained at the FEAF-NAVFE level. In June 1953, after the Seventh Fleet had agreed to participate integrally in the work of the JOC in Korea, the Fifth Air Force proposed that a Navy representative might also properly be included as a member of the FEAF Formal Target Committee. The FEAF reaction to this proposal, however, noted that no over-all theater air commander had ever been appointed by CINCUNC. General Weyland therefore reasoned that since naval air units were not under FEAF's operational control a naval air officer could not be ordered to participate as a member of the FEAF Formal Target Committee. He nevertheless noted that FEAF was charged with the coordination control of all air operations over Korea and that naval representation in the target committee meetings was highly desirable. Based on this decision, the commander Fifth Air Force was instructed to invite a Navy representative from the JOC in Korea to attend meetings of the FEAF Formal Target Committee.<sup>94</sup> This action, taken during the last days of Korean hostilities, came too late to have any operational significance.

#### STATUS OF FEAF IN MIDDLE 1952

**Organization of Forces:** With headquarters at Tokyo in May 1952 the Far East Air Forces, the USAF component of the UNC/FEC, was commanded by Lt. Gen. O. P. Weyland. In World War II, General Weyland had been outstanding in the field of tactical air warfare and had com-

manded the XIX Tactical Air Command in Europe. After 4 May 1950 he had been commander of the USAF Tactical Air Command, but on 20 July 1950 he had come to FEAF on supposedly temporary duty as vice commander for operations. He had assumed command of FEAF on 10 June 1951 shortly after General Stratemeyer had been stricken with a heart attack. Promoted

\*See Chap. VI, pp. 222-28.

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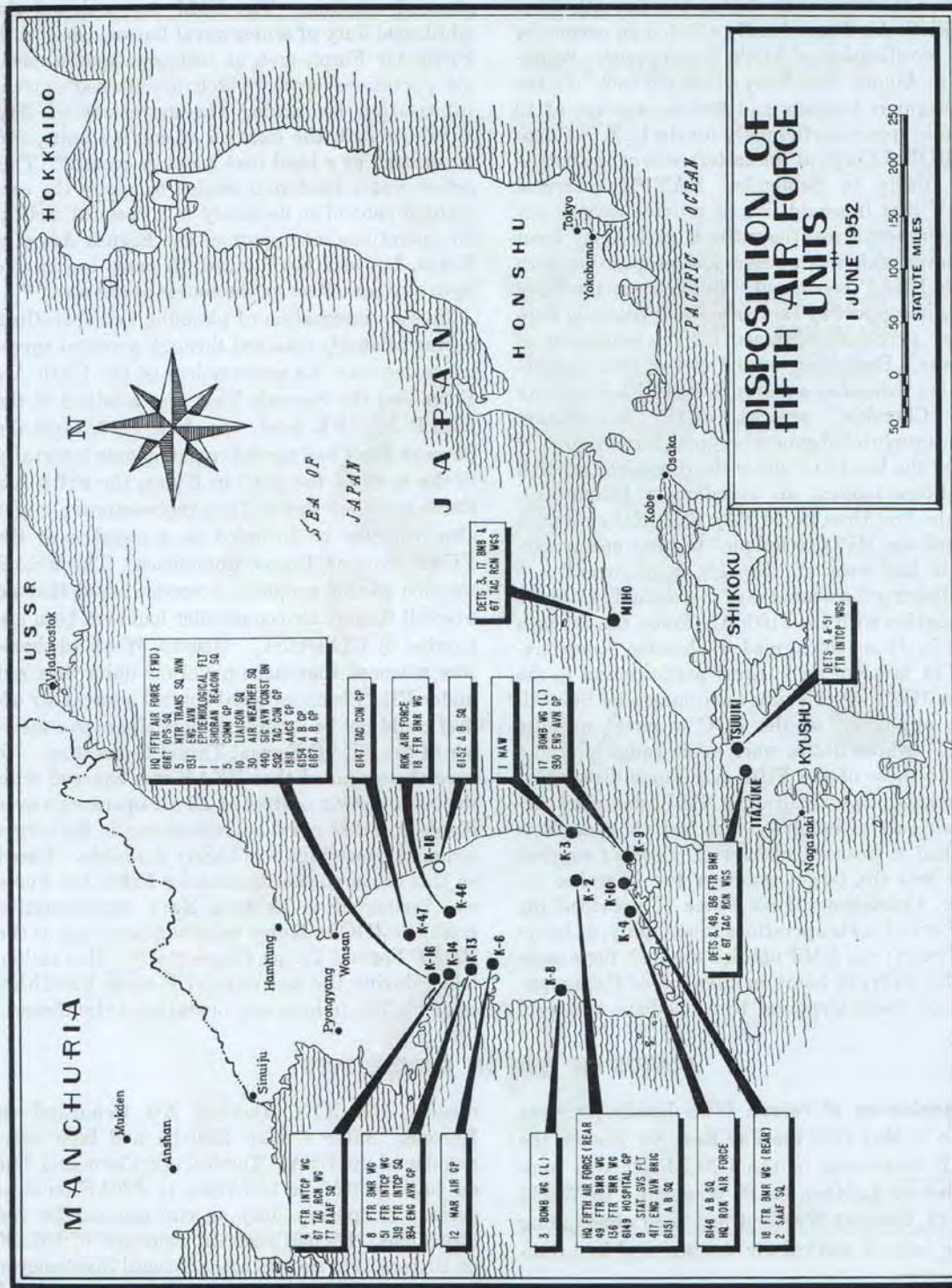


Figure 2.

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to the rank of general on 5 July 1952, Weyland would remain as commander FEAF during the remainder of the Korean war.

Although FEAF was the USAF command component of the UNC/FEC, its area of responsibility was actually larger than that of the Far East Command (see figure 1). This situation had come about as the result of two JCS decisions: the first, on 16 April 1951, had transferred the security responsibilities for the Marianas and Bonin-Volcano Islands to the Pacific Command; the second, on 15 March 1952, had charged the Pacific Command with the defense of Formosa, the Pescadores, and the Philippines. These actions did not change the authority of commander FEAF over USAF units and installations in the Marianas and Philippines.<sup>95</sup> For the accomplishment of its missions in its area of responsibilities FEAF had organized its forces into seven principal subordinate commands, based both in the Far East Command and Pacific Command areas of operations.

Largest of the FEAF subordinates was the Fifth Air Force, with a divided headquarters comprising a forward echelon at Seoul and a rear echelon at Taegu, Korea. It was USAF practice to accord the Fifth Air Force commander a temporary rank as lieutenant general and to rotate this commander yearly. Thus since 1 June 1951, Lt. Gen. Frank F. Everest had commanded the Fifth Air Force, and he was succeeded on 30 May 1952 by Maj. Gen. Glenn O. Barcus, who was promoted to lieutenant general on 10 June 1952. At the end of another year, Lt. Gen. Samuel E. Anderson assumed command of the Fifth Air Force on 31 May 1953. Brig. Gen. Dudley D. Hale served as Fifth Air Force vice commander until 23 September 1952, at which time he was relieved by Brig. Gen. E. H. Underhill. The position of deputy commander (rear) with the responsibility for control of the rear echelon of the Fifth Air Force headquarters at Taegu was filled by Brig. Gen. Ernest K. Warburton, who was relieved on 10 March 1953 by Brig. Gen. Stuart P. Wright.<sup>96</sup>

A succinct statement of the Fifth Air Force mission required it to perform the following tasks:<sup>97</sup>

Maintain air superiority in the combat zone, with the exception of areas in amphibious operations as designated by commander FEAF.

Conduct joint planning, training, and operations with UN ground and naval forces.

Within capabilities, provide escort when requested by commander FEAF Bomber Command and commander 315th Air Division (Combat Cargo).

Conduct search and rescue activities in the Fifth Air Force area of responsibility, or as required.

Provide for the maintenance, operation, and internal security of assigned air bases.

Exercise operational control of antiaircraft artillery units in Korea with the exception of antiaircraft units organic to army divisions.

Conduct air reconnaissance as necessary to the accomplishment of its own mission and as directed by commander FEAF.

Conduct special missions as directed by commander FEAF.

With the exception of a few rear echelon maintenance combined (REMCO) detachments at air bases in southern Japan, the entire tactical unit strength of the Fifth Air Force was deployed in Korea (see figure 2). The deployment of Fifth Air Force assigned or attached tactical units as of 31 May 1952 was as follows:<sup>98</sup>

Kimpo Airfield (K-14)

4th Fighter-Interceptor Wing (3 squadrons F-86's)

67th Tactical Reconnaissance Wing (3 squadrons RF-51's, RF-80's, and RB-26's)

77th RAAF Squadron (Meteor-8's)

Seoul Municipal Airfield (K-16)

Det. 1, 3d Air Rescue Squadron

10th Liaison Squadron

Suwon Airfield (K-13)

51st Fighter-Interceptor Wing (2 squadrons F-86's)

8th Fighter-Bomber Wing (3 squadrons F-80's)

319th Fighter-Interceptor Squadron (F-94's)

Chunchon Airfield (K-47)

6147th Tactical Control Group (2 squadrons T-6's)

Kunsan Airfield (K-8)

3d Bombardment Wing, Light (3 squadrons B-26's)

Chinhae Airfield (K-10)

18th Fighter-Bomber Wing (2 squadrons F-51's)

2d South African Air Force Squadron (F-51's)

39th Fighter-Interceptor Squadron (F-51's)

Pusan East Airfield (K-9)

17th Bombardment Wing, Light (3 squadrons B-26's)

Taegu Airfield (K-2)

49th Fighter-Bomber Wing (3 squadrons F-84's)

136th Fighter-Bomber Wing (3 squadrons F-84's)

Available to commander Fifth Air Force's coordination control were the six fighter squadrons comprising Marine Air Groups 12 and 33 of the 1st Marine Air Wing based at Pohang (K-3), Pyongtaek (K-6), and Kunsan (K-8). With the exception of an all-weather fighter squadron, the units of the 1st Marine Air Wing were generally utilized by the Fifth Air Force JOC in close-support missions.

The Far East Air Forces Bomber Command (Provisional) had been organized on 8 July 1950, and from its headquarters at Yokota Air Base near Tokyo the FEAF Bomber Command gave operational direction to the three B-29 medium bomber groups and the strategic reconnaissance units present in the Far East. Personnel and aircraft replacements for this command were furnished by the USAF Strategic Air Command (SAC), which also provided the commander FEAF Bomber Command, generally rotating this officer every six months. On 15 March 1952 Brig. Gen. Wiley D. Ganey had taken command and would continue as commander until 5 October 1952, when relieved by Brig. Gen. William P. Fisher. General Fisher would, in turn, be relieved by Brig. Gen. Richard H. Carmichael on 15 June 1953. The FEAF Bomber Command was directly responsible for conducting long-range bombardment operations, the attack and destruction of targets in support of UNC forces in Korea, for conducting air reconnaissance as necessary, and for assisting in the defense of Japan and the Ryukyus. The command was also responsible for planning and training in preparation for Strategic Air Command operations, and the support thereof, in the Far East. The FEAF Bomber Command possessed operational control of the following tactical units:<sup>99</sup>

Yokota Air Base, Honshu

- 98th Bombardment Wing, Medium (3 squadrons B-29's)
- 91st Strategic Reconnaissance Squadron, Medium, Photo (RB-29's, RB-45's, RB-50's)

Kadena Air Force Base, Okinawa

- 19th Bombardment Group, Medium (3 squadrons B-29's)
- 307th Bombardment Wing, Medium (3 squadrons B-29's)

With the exception of the 19th Bombardment Group, which was assigned to the Twentieth Air Force, all of these organizations were attached from the U. S. Strategic Air Command. Both the Headquarters, FEAF Bomber Command and its combat units were tenants on the bases they occupied and drew varying amounts of logistical support from the Japan Air Defense Force on Honshu and from the Twentieth Air Force on Okinawa.

The 315th Air Division (Combat Cargo) had been activated by FEAF on 21 January 1951 to replace the temporary FEAF Combat Cargo Command and to serve as a permanent organization

required to control all theater airlift in the Far East. Under the command of Brig. Gen. Chester E. McCarty\* since 10 April 1952 and with headquarters at Higashi Fuchu, near Tokyo, the 315th Air Division was a major subordinate air command, directly responsible to commander FEAF. The mission of the 315th required it to provide continuing airlift and air evacuation support for UNC forces in Korea and within the FEC as required, to conduct airborne missions and aerial resupply, to establish and operate aerial ports of embarkation, and to provide air transportability and airborne training.<sup>100</sup> The tactical units of the 315th Air Division occupied the following deployment on 30 June 1952:<sup>101</sup>

Seoul Municipal Airport (K-16)

- 21st Troop Carrier Squadron (Fwd. Ech.) (C-47's)

Tachikawa Air Base, Honshu

- 374th Troop Carrier Wing (2 squadrons C-54's and C-124's)

Royal Thai Air Force Det. (C-47's)

- 61st Troop Carrier Group (2 squadrons C-54's)

Ashiya Air Base, Kyushu

- 403d Troop Carrier Wing (3 squadrons C-119's)
- 314th Troop Carrier Group (3 squadrons C-119's)
- 21st Troop Carrier Squadron (Rear Ech.)
- 53d Troop Carrier Squadron (C-54's)
- Royal Hellenic Air Force Det. (C-47's)

Brady Air Base, Kyushu

- 315th Troop Carrier Wing (4 squadrons C-46's)

The 315th Air Division (Combat Cargo) also controlled the 801st Medical Air Evacuation Squadron and the 6127th Air Terminal Group, both of which had detachments where needed in Japan and Korea. A series of organizational changes in the 315th Air Division would not be completed until the autumn of 1952.†

The Japan Air Defense Force had been activated by FEAF on 1 March 1952 to replace the simultaneously disbanded 314th Air Division and to conduct the air defense of the Japanese Islands. Brig. Gen. Delmar T. Spivey (promoted to major general on 4 December 1952), who had come to Japan on 10 August 1950 as Fifth Air Force vice commander for the rear echelon and who had commanded the successor 314th Air Division, would continue as commander of the JADF until 20 January 1953, when relieved by Maj. Gen. Roy H. Lynn. Although its major defense mission was not directly related to the Korean air war, the

\*General McCarty was promoted to major general on 23 June 1953.

†See Chap. VII, pp. 263-67.

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JADF provided logistical support for Fifth Air Force detachments at Japanese bases and furnished numerous administrative services to the 315th Air Division. From the beginning of its separate existence it had been obvious that the JADF could not compete with the Fifth Air Force for the possession of scarce tactical air units but would rather manage an interchange of tactical units when this was necessary. By 31 May 1952 the assigned or attached units of the JADF had the following deployment:<sup>102</sup>

Chitose Air Base, Hokkaido  
196th Fighter-Bomber Squadron (F-84's)

Misawa Air Base, Honshu  
116th Fighter-Bomber Wing (2 squadrons F-84's)  
Flt., 68th Fighter-Interceptor Squadron (F-94's)  
Flt. C, 3d Air Rescue Squadron

Nigata Air Base, Honshu  
Flt., 41st Fighter-Interceptor Squadron (F-94's)

Johnson Air Base, Honshu  
35th Fighter-Interceptor Wing (2 squadrons F-51's and F-80's)  
339th Fighter-Interceptor Squadron (F-94's)  
3d Air Rescue Squadron, and Flt. A.

Komaki Air Base, Honshu  
Flt. B, 3d Air Rescue Squadron

Ashiya Air Base, Kyushu  
Flt. D, 3d Air Rescue Squadron

Itazuke Air Base, Kyushu  
68th Fighter-Interceptor Squadron (F-94's)

Combat crews and squadrons from JADF tactical units were utilized in Korea when they were needed. Thus beginning on 30 November 1951 the 116th Fighter-Bomber Wing, although based at Misawa for the defense of northern Japan, maintained one F-84 squadron in rotational combat at Taegu (K-2). The USAF had agreed to maintain one SAC fighter wing on rotational defense duty in Japan, and when the first of these units, the 31st Fighter-Escort Wing, reached Japan with its F-84G's in July 1952, it would be possible for the JADF to release the tactical units of the 116th Fighter-Bomber Wing to the Fifth Air Force for station in Korea. During 1952 and 1953 a few additional unit transfers from the Fifth Air Force would augment the never large tactical strength of the JADF.

Providing logistical support to USAF units in the Far East in May 1952 was the Far East Air Materiel Command (FEAMCom) with headquarters at Tachikawa Air Base, and commanded by Brig. Gen. John P. Doyle. On 10 June 1952 Brig. Gen. Paul E. Ruestow (promoted to major

general on 6 September 1952) relieved General Doyle, and on 2 July 1952, in order to bring its nomenclature into line with its major status, the command was redesignated as the Far East Air Logistics Force (FEALogFor). Responsible for air force supply and maintenance in the Far East, FEALogFor had a tremendous air depot at Tachikawa, and it controlled smaller depots at Iwakuni Air Base and at Clark Air Force Base, Luzon. In January 1953 another depot would be established at Chinhae (K-10) Airfield in Korea.<sup>103</sup>

The remaining two major subordinate FEAF air commands did not participate directly in the Korean hostilities. The Twentieth Air Force, with headquarters at Kadena Air Force Base, Okinawa, was commanded by Maj. Gen. Ralph F. Stearley until 8 February 1953, when he completed a normal tour of duty and was relieved by Brig. Gen. Fay R. Upthegrove. As a part of its mission the Twentieth Air Force defended and supported the operations of the medium bomber organizations based at Kadena.<sup>104</sup> The Thirteenth Air Force, with headquarters at Clark Air Force Base, Luzon, provided for the maintenance, security, and operations of USAF installations and organizations in the Philippines. Maj. Gen. Ernest Moore was commander of the Thirteenth Air Force until 9 October 1952 when he was relieved by Brig. Gen. John W. Sessums.<sup>105</sup> Unlike the other FEAF subordinates, a large part of the Twentieth Air Force's and all of the Thirteenth Air Force's geographical areas of responsibility lay not in the Far East theater but in the Pacific theater (see figure 1). Neither had a large tactical deployment since each had furnished all but a single squadron of their fighter wings to the Korean air war. The Thirteenth had retained the 44th Fighter-Bomber Squadron of its 18th Wing and had also the 581st Air Resupply and Communications Wing. The Twentieth had retained the 26th Fighter-Interceptor Squadron of the 51st Wing and also utilized the 4th Fighter-Interceptor Squadron (F-94's) for the defense of Okinawa. Scattered at bases in these two air forces' areas of responsibility were flights of the 2d Air Rescue Squadron.

**FEAF Aircraft Problems:** Measured in terms of the Communist air order of battle in the Far East, or in context with the potential target systems in Korea, the number of combat aircraft available to the FEAF in mid-1952, although the largest

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aggregation of USAF aircraft in an overseas theater, was quite limited. During the spring of 1952 the shortage of combat planes had gravely affected the success of the comprehensive railway interdiction programs, and the continued shortage of combat aircraft at mid-1952 was a factor of considerable importance to the air planners who were working out the details of a new air pressure strategy.

Counting every airplane, including those in storage and in salvage and of all types, the FEAF had in May 1952 a grand total of 1,954 aircraft. Only aircraft in units, however, possessed immediate operational significance. Of such planes, the Fifth Air Force possessed 111 B-26's, 45 F-51's, 83 F-80's, 97 F-84's, 138 F-86's, and 24 F-94's, for a total of 111 light bombers and 387 fighters. Supplementing the Fifth Air Force strength were approximately 25 Meteor Mk.-8 aircraft of the 77th Royal Australian Air Force Squadron, approximately 27 F-51's of the 2d South African Air Force Squadron, and approximately 134 fighters and fighter-bombers possessed by the 1st Marine Air Wing. The FEAF Bomber Command had 99 B-29 medium bombers. The Thirteenth Air Force had 27 F-80's. The Twentieth Air Force had 28 F-80's and 24 F-94's. The Japan Air Defense Force possessed 23 F-51's, 28 F-80's, 60 F-84's, and 49 F-94's, for a total of 159 fighters. The 835 aircraft possessed by FEAF tactical units represented a potential FEAF striking force, but only a part of this force was available for duty in Korea. Active in this combat area were the 498 aircraft of the Fifth Air Force, the 99 FEAF Bomber Command medium bombers, and approximately 186 SAAF, RAAF, and 1st Marine Air Wing planes, or a total of some 783 aircraft. Counting all aircraft in committed units, which included reconnaissance, transport, rescue, and liaison aircraft as well as fighters and bombers, FEAF possessed at the end of May 1952 1,031 planes actively engaged in the Korean war, a total which, when friendly foreign and Marine fighters and transports were added, rose to a figure of approximately 1,261 aircraft.<sup>108</sup>

Measured in terms of the Communist air order of battle in the Far East even the generally meaningless grand total of 1,954 FEAF aircraft was dwarfed by the mammoth-sized Soviet Air Forces in the Far East and was nearly equalled by the size of the Chinese Communist Air Force

(CCAF). During the first half of 1952 the Soviet Far Eastern Air Force remained virtually stable at an over-all estimated strength of 5,360 aircraft, but the Russians were believed to have made substantial progress in converting their fighter units from piston to jet aircraft. These Soviet air units were not expected openly to intervene in Korea, but from time to time Soviet "volunteer units" appeared for combat at the Yalu. By mid-1952 the CCAF had gotten its 22 air divisions nearly to authorized strength, and, out of a total of 1,830 aircraft, the CCAF had concentrated in Manchuria an estimated 1,115 planes, including 640 jet aircraft.<sup>107</sup> \*

As the peace talks had dragged on and the Communist air forces had waxed in strength, General Weyland had become increasingly apprehensive about the prospect of maintaining UNC air superiority in Korea. If the war were to continue, he reasoned on 12 July 1951, the success of the UNC forces would be determined by a struggle between the CCAF and the FEAF. "Unless our relative air strength . . . is maintained equal or better than the CCAF," Weyland had informed USAF, "I feel that our expenditures of men and money in the Korean war may well have been in vain."<sup>108</sup> In December 1951 General Ridgway had urged the JCS to consider the serious challenge to UNC air superiority over Korea: to achieve bare numerical parity with the hostile MIG-15 forces, FEAF required eight F-86 wings.<sup>109</sup> But the best that USAF had been able to do in the way of furnishing the F-86 Sabres which alone were able to combat the MIG's on anything approaching equal terms had been to provide FEAF with a total of five Sabre squadrons: thus in May 1952 the Fifth Air Force possessed some 138 F-86's in tactical units with which to confront an estimated 640 Chinese MIG-15's based in Manchuria. FEAF, moreover, did not possess any large back-up theater reserve for the Sabres: all together the total theater inventory of Sabres at the end of May stood at 167 aircraft.<sup>110</sup>

The striking force with which FEAF put ordnance on hostile targets in North Korea comprised the medium bombers of the FEAF Bomber Command and the light bombers and fighter-bombers of the Fifth Air Force. In terms of enemy opposition much of this striking force was obsolescent;

\* See Chap. III, pp. 39-41.

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in terms of the potential target systems it was actually quite small; and during the first year of truce negotiations it had been slipping downhill due to depreciation, battle damages, and combat losses. In view of its global responsibilities, the USAF had fixed the strength of the FEAF Bomber Command at a total of 99 B-29 bomber-type aircraft (80 unit equipment, plus 3 command support planes per group). These medium bombers were available for strikes against fixed and prebriefed targets, but, in recognition of the MIG hazard, they flew only at night, directing their bombs by shoran or by ground radar control. Although the Strategic Air Command generally maintained a few more than the 99 aircraft in the theater to provide for such factors as battle damage and pipeline transit time, the maintenance of such a number of B-29's at FEAF's disposition was increasingly difficult as the SAC converted its Zone of Interior wings to more modern strategic bombers.<sup>111</sup> As a result of a long series of emergency actions, the USAF by the spring of 1952 had been able to increase the Fifth Air Force's authorization of light bombers to 120 B-26 aircraft, plus 50 percent theater reserve. Such an authorization had been sufficient to equip only the 3d Wing at a war strength of 24 B-26's per squadron, and the 17th Wing had remained equipped at a reduced strength of 16 B-26's per squadron. Like the B-29's, the B-26 light bombers operated at night in a duty for which they were not particularly fitted, flying principally night-intruder missions and having the capability of bombing by ground radar control. In May 1952 FEAF possessed a theater inventory of 187 B-26's, but most of these were "cats and dogs" models, the modification of which for combat was requiring a large share of FEAMCOM's depot effort. The two B-26 wings were not going to reach their authorized strength of possessed aircraft until September 1952.<sup>112</sup>

Of all the force available to FEAF only the fighter-bombers of the Fifth Air Force were able to attack by day either fixed or moving targets in Korea; yet at mid-1952 every Fifth Air Force fighter-bomber wing was gravely deficient in authorized aircraft and only two of these wings were partially equipped with modern jet fighter-bombers. Each of these wings was authorized a strength of 25 aircraft per squadron: in May 1952 the 8th Fighter-Bomber Wing actually possessed 79 F-80

aircraft, the 18th Fighter-Bomber Wing possessed 46 F-51 Mustangs, the 49th Fighter-Bomber Wing possessed 47 F-84's, and the 136th Fighter-Bomber Wing possessed 40 F-84's. The deficiency in the assigned fighter-bomber strength was resultant from some three causes. The F-51 Mustang was a conventional fighter and the F-80 was the earliest of Air Force operational jet fighters; both were obsolescent, no longer in production, and had seen hard service in the first two years of the Korean war. Although FEAF carried a substantial inventory of F-80's and F-51's, most of these planes were so combat worn as to prevent any practicable renovation. The F-84 Thunderjet, on the other hand, was a new USAF fighter-bomber, as yet unavailable to FEAF in requisite numbers. These fighter-bomber aircraft, moreover, had taken heavy losses from Communist ground fire during the comprehensive rail interdiction program. Between August 1951 and March 1952 FEAF had lost 236 aircraft on interdiction sorties as against a replacement of only 131 of the same types during this time.<sup>113</sup>

The USAF had long been thoroughly cognizant of FEAF aircraft problems, but in 1950 it had been what General Vandenberg had described as a "shoe-string Air Force," and it had had to support FEAF initially from stored stocks of equipment left over from World War II.<sup>114</sup> At the end of 1951 the best that the USAF had been able to do was to maintain 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."<sup>115</sup> By mid-1952 aircraft production in the United States was beginning to catch up with demands imposed by the Korean war, and FEAF was at last promised the modern equipment which it required to bring its units up to strength.

In February 1952 the JCS advised CINCFE that the USAF had purchased 60 F-86's from a Canadian aircraft corporation (Canadair), which with other Sabres to become available from U. S. production should enable FEAF to achieve two war-strength F-86 interceptor wings, together with 50 percent theater reserve, by June 1952.<sup>116</sup> In order to provide the 51st Wing with a full squadron complement, FEAF effected the transfer of the 39th Fighter-Interceptor Squadron from its attachment to the 18th Fighter-Bomber Wing

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on 1 June 1952, and during that month the 39th Squadron began to receive new F-86F aircraft, the first of this model Sabre to reach the Far East. This conversion program met some slippage in aircraft deliveries, so that it was not until August 1952 that the six Sabre squadrons were up to authorized strength. During September, FEAF built up the authorized 50 percent combat reserves of Sabres.<sup>117</sup>

In May 1952 USAF further agreed to bring the Fifth Air Force F-84 fighter-bomber wings up to authorized war-strength and to provide FEAF with a 50 percent combat reserve of F-84's.<sup>118</sup> Aware that something had to be done to relieve the F-51's and F-80's from combat, and expecting increased Sabre production, USAF on 18 July 1952 agreed to plans whereby the 18th Wing with the 2d SAAF Squadron and the 8th Wing would be converted to F-86F aircraft, properly modified as fighter-bombers, with a target date of January 1953.<sup>119</sup> These fighter-bomber programs would meet some slippage due to production delays,\* but these long-awaited augmentations of aircraft strength offered a considerable amount of reassurance to the FEAF planners who were projecting the air pressure strategy.<sup>120</sup>

As the air pressure operations were getting underway, a few theater actions offered some benefit to the fighter-bomber situation. During June 1952 the 18th Fighter-Bomber Group left the 18th Wing as a rear echelon at Chinhae (K-10) and moved up to Hoengsong Airfield (K-46), where its old Mustangs were only 60 miles behind the front lines and could reduce their flying hours.<sup>121</sup> At the arrival of the SAC rotational fighter wing in Japan during July, the Fifth Air Force took over the F-84 wing which had been attached to the JADF: thus effective 10 July the 116th Fighter-Bomber Wing was inactivated† and its personnel and equipment received by the simultaneously activated 474th Fighter-Bomber Wing which opened at Kunsan Airfield (K-8) that same day. The 474th Wing, which had then had 57 F-84's, flew its first combat missions from Kunsan on 1 August.<sup>122</sup>

\*See Chap. V, pp. 155-58.

†Because their unit designations had to be returned to the U. S. Air National Guard, the 116th and 136th Fighter-Bomber Wings and their subordinate organizations were relieved from the federal service effective 10 July 1952 and their personnel and equipment were assumed by the simultaneously activated 474th and 58th Fighter-Bomber Wings (Hist. D/Org. and Manpower FAF, July 1952).

**The FEAF Potential for Sustained Combat:** Although FEAF's combat potential was directly related to the number of its possessed aircraft, two other major factors—availability of aircrews and of logistical support—dictated the rate at which the possessed planes could be flown. During World War II aircrew training and aircraft production had been sufficiently bountiful that combat air units had been generally able to fly their crews and planes to exhaustion with a reasonable certainty of securing timely replacements. In Korea, however, such was not the case and combat operations had to be closely figured in terms of spare parts and supply, engine availability, aircraft age, expectations of battle damage, and personnel manning and experience, all of which had to be forecast and requisitioned up to six months in advance. At times of adversity for the UNC cause, FEAF planes could be and were flown to exhaustion, as in November and December 1950 when the medium bombers were required to sustain a rate of effort which decimated their in-commission status and hospitalized crews with combat fatigue. In this same effort FEAF had knowingly used up a great number of F-51 and F-80 fighter-bombers. Operations in times of emergency could for a short time exceed calculated planning factors, but such expenditures of effort had to be compensated by a subsequent proportionate reduction in the rate of operations.<sup>123</sup> These planning factors thus represented the maximum sortie rate which could be sustained by a given type of aircraft per month, a rate which if long exceeded would result in the collapse of the support and a shortage of replacement crews for that type aircraft.

The maximum combat capability which FEAF could sustain was a derivative from the number of its possessed aircraft in terms of an operational planning factor representing logistical support and aircrew availability. For the B-29 medium bombers the FEAF planning factor at mid-1952 was six sorties per month per aircraft, which meant that in all-out combat the Bomber Command could sustain a daily average of 16 B-29 sorties. Actually, Bomber Command preferred to schedule from 12 to 15 combat sorties daily and to devote the remaining capability to sorely needed shoran flight training.<sup>124</sup> Calculated on a basis which sought to maintain 75 percent of Fifth Air Force aircraft in a combat ready status at all

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times, FEAF planning factors set the maximum monthly sortie rate per F-51 at 25.5, per F-80 at 28.5, per F-84 at 25, per F-86 at 25, and per B-26 at 17. Although the figure would vary upwards with the increased number of possessed aircraft in the autumn of 1952, and could be juggled by the expedient of flying shorter missions than the averages contemplated by the planning factors, the Fifth Air Force in mid-1952 could, on the basis of the FEAF planning factors, sustain something on the order of a daily average of 115 F-86 counterair sorties, 196 fighter-bomber sorties, and 63 light bomber sorties. Figured on a basis of the FEAF F-51 factor, the 2d SAAF Squadron could add about 24 fighter-bomber sorties each day to the Fifth Air Force total. While planning factors are not available for these units, the 77th RAAF Squadron in the period July through September flew an average of about 18 counterair sorties with its Meteors each day, while the 1st Marine Air Wing averaged approximately 100 close-support, interdiction, armed reconnaissance, counterair, and escort sorties each day.<sup>125</sup>

The total FEAF striking power was thus a finite quantity and actually quite small in terms

of the tasks presented to it. In any programming of a sustained air campaign the limited capability of the FEAF effort had to be taken into account in order that each sortie flown should be directed against a carefully selected target which, once destroyed, would represent the maximum damage to the enemy. General Weyland emphasized the fact that FEAF never possessed the requisite strength to do a job completely: air action against the Communist rail lines in North Korea stopped all but 4 or 5 percent of the prewar rail traffic, but neither FEAF nor the entire UNC air forces had a sufficient force to take out the remaining small percentage of traffic which proved able to sustain the Communist armies in a static employment. During the air pressure campaign, moreover, FEAF would not have sufficient strength to attack many marginal value targets identified in North Korea.<sup>126</sup> The manner in which this essentially scarce air effort could be most profitably employed against the most lucrative targets was going to be a major concern of the FEAF air commanders who implemented the air pressure strategy.

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## Chapter II

### PLANNING THE STRATEGY OF AIR PRESSURE

After December 1950 the United Nations military objective in Korea was to achieve acceptable armistice terms, not to destroy the Communist armies nor to capture enemy territory. And yet, even after the Communist armies had been decisively defeated by air-ground action in May and June 1951, the UNC military strategy had remained directed against these already-beaten Communist armies. UNC air power, which alone possessed an ability to effect a selected destruction over the entire spectrum of hostile objectives in Korea, was utilized by the UNC in an intensified interdiction campaign designed to delay and disrupt the flow of enemy logistical support to his frontline forces. No small portion of the UNC air effort, yet not as much as the ground commanders desired, was directed into close-support strikes against dug-in enemy troops along the stalemated battle line. In short, UNC air power was being employed in a nondecisive tactical concept against an enemy army which could not afford to launch another major assault and in support of UNC ground forces which were expected to do no more than to defend the ground they held. The UNC military strategy was not in context with its military objective.

As long as the UNC military operations remained directed against the entrenched personnel and fleeting logistics of the Red armies and inflicted no unacceptable damage upon the ruling regime itself, the Communist hierarchy was satis-

fied to prolong the armistice talks, using these meetings as a forum for propaganda while they obtained concessions from the UNC. Finally, in April 1952, the UNC could compromise no further and still maintain its honor, and it was at last compelled to reassess its military strategy. Long prior to this breaking point, FEAF commanders had known the need for a new UNC strategy which would utilize air pressure against hostile targets in North Korea in a manner designed to secure acceptable armistice terms. Quite a few air leaders had never swallowed the myth that a rejuvenated Red army was going to attempt another all-out offensive in Korea, but before they could pry loose the air effort from this ground concept they had both to demonstrate the indecisiveness of the UNC military strategy pursued thus far and to convince ground commanders that there were logical reasons why the Communists could not afford another all-out ground offensive. Finally, the top FEAF air officers had to pioneer beyond existing air doctrine to establish a plan whereby air power would be used as the sole agent to sustain such relentless pressure upon the hostile military forces as to force the ruthless Red leaders to accept terms agreeable to the UNC. When the truce talks began to founder in April 1952, the FEAF leaders had already prepared a strategic air plan which they had seen at least in concept from the beginning of Korean hostilities.

#### PLANNING THE REVISION OF AIR STRATEGY

**Early Thoughts on Air Pressure:** During World War II air power had demonstrated an ability to produce emotional or psychological responses in the ruling elites and peoples of enemy nations which were often more significant than the actual

physical damage done to enemy targets. Early in the Korean hostilities, FEAF leaders had desired to exploit these psychological attributes of air power. Maj. Gen. Emmett O'Donnell, Jr., first commander of the FEAF Bomber Command,

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had greatly desired "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." O'Donnell had desired to inform the aggressors that they could "either stop the aggression and get back over the thirty-eighth parallel or they better have their wives and children and bedrolls . . . with them because there is not going to be anything left up in North Korea to return to."<sup>1</sup> Again at the end of September 1950, when the North Korean Communists were retreating in wild disorder whence they had come, General Stratemeyer had proposed to send a 100 B-29 strike against military targets in the hostile capital of Pyongyang, a strike which would both destroy military objectives and cause the enemy to listen attentively to UNC terms. The JCS, however, had immediately informed the CINUNC that any plans calling for an all-out bombing attack against Pyongyang involved "serious political implications."<sup>2</sup> Sensitive to world opinion, the JCS had been willing to permit no employment of air power which might inflict unnecessary civilian casualties.

The first year of the Korean war had been fought according to established air doctrines. A strategic air assault had largely destroyed the North Korean industrial capability to support a war. Tactical air operations had maintained control of the air, had interdicted hostile lines of supply, and had given close support to UNC ground troops. In the circumstances presented, these established doctrines had been sufficient to defeat the Communist land armies. But with the beginning of the truce talks these established doctrines lacked applicability: "Almost imperceptibly," noted a FEAF report, "we moved into a situation where the conventional doctrine for the employment of tactical air forces applied only to a portion of the air effort."<sup>3</sup>

"In time," wrote General Weyland, "the pressure from air attack came to be recognized as the prime objective of the air offensive."<sup>4</sup> Early in 1952 it was quite apparent to the FEAF leaders that the military situation in Korea was completely stalemated. Chief among those who began to advocate the necessity of a new air strategy was Brig. Gen. Jacob E. Smart, who in January 1952

became Deputy for Operations, FEAF.<sup>5</sup> At the end of February 1952, quietly and without fanfare, General Smart had a new statement of FEAF combat operations policy inserted in the weekly intelligence publication: whereas up until that time these statements had recorded an emphasis upon air superiority, interdiction, and air support, the new statement noted that FEAF operations sought:<sup>6</sup>

1. To maintain effective and positive military pressure on the North Korean military armies, as well as on the Chinese Communist military forces committed to the Korean war.
2. To influence current Korean armistice negotiations in order that the United Nations Command may obtain the most favorable results.
3. To retain a capability for other operations in event of a general emergency.

There had been no change in officially stated FEAF mission directives nor were the air operations at the end of February 1952 greatly different from those which had been conducted weekly since August 1951, but FEAF was now ready to announce that it conceived its operations to be in the nature of military pressure against the enemy.

Given the acceptance of the opinion among FEAF operations personnel that the current emphasis on rail interdiction was not getting results and that a new application of FEAF effort was required, General Smart nevertheless had to reconcile two strongly held and widely divergent viewpoints before he could secure official acceptance of a strategy of air pressure. The first of these viewpoints was the attitude of some ground commanders that more and still more close air support was needed. Another viewpoint, this one held by several members of the FEAF Target Committee, was that increased interdiction effort on rail lines and bridges was vital to the maintenance of the static ground situation. Having answered these diverse viewpoints, General Smart had to offer a plan by which air power could break the truce talk stalemate.<sup>7</sup>

**The Randolph-Mayo Staff Study:** Given the problem of devising the ways and means of exerting maximum air pressure on the Communist forces in North Korea through the optimum application of FEAF effort, Col. R. L. Randolph, director of the FEAF combat operations division, and Lt. Col. B. I. Mayo matured on 21 April 1952 a study which was to provide the framework for the adoption of

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a new air strategy in Korea.<sup>8</sup> This study was introduced by a penetrating analysis of the previous seven months' experience against the North Korean railways, in which the two authors demonstrated that the enemy, benefiting from controlled supply consumption in a generally static ground war, would eventually through logistical osmosis build his frontline stockpiles to any level he desired. This rail interdiction effort had not been wasted because these routes of transportation had been so badly mauled that they would further deteriorate during the summer rains of 1952. The rail net, moreover, had been put in a marginal condition for supporting any major Communist offensive and it could be kept in limited operating condition by subsequent periodic air attacks. But the continuation of the railway interdiction program as a major sustained UNC air effort was obviously impracticable: neither rail track nor rail lines was especially costly to the enemy, and after December 1951 air attacks against the rail system had reached a virtual state of balance wherein the UNC air ability to inflict damage was approximately equalled by the enemy's ability to repair the damage. To continue the rail attacks would be, in effect, to pit skilled pilots, equipped with modern, expensive aircraft, against unskilled oriental coolie laborers, armed with pick and shovel. Even if UNC air action did delay or diminish the flow of hostile supplies to the enemy, such air action could not place intolerable pressure upon the enemy so long as he maintained a static ground front.

After this introduction, Randolph and Mayo examined the possible applications of FEAF effort which appeared practicable under the circumstances prevailing in Korea. They determined that FEAF could:

- (1) Maintain UNC air superiority through counterair action and airfield neutralization;
- (2) Destroy or damage enemy supplies, equipment, facilities, and personnel;
- (3) Delay the movement of enemy supplies, equipment, and personnel; and
- (4) Provide close support for ground operations.

With a static ground situation, delaying the enemy's supplies or attacking entrenched troops along the front lines promised no more than minimum achievements with the probability of costly air losses. Since the enemy based his airplanes north of the Yalu, FEAF could hardly bring pres-

sure upon the enemy by destroying his air capability, but FEAF nevertheless had to maintain an air superiority over North Korea as a matter of first priority to prevent the enemy from bringing pressure to bear on UNC forces. Airplanes, moreover, were expensive to the enemy and Randolph and Mayo thought that as many of them as possible should be destroyed in air-to-air fighting. The real opportunity which FEAF had to lay pressure upon the enemy was by destroying his supplies, equipment, facilities, and personnel. They therefore recommended that the first priority of FEAF effort be given to the maintenance of UNC air superiority and that such effort as remained should be employed to accomplish "the maximum amount of selected destruction, thus making the Korean conflict as costly as possible to the enemy in terms of equipment, supplies, and personnel."

Having arrived at the broad concept of achieving air pressure through selective destruction, Colonels Randolph and Mayo attempted to show what sorts of targets could be attacked. They proposed that any target list utilized for the air pressure operations had to be highly flexible and subject to constant review in order to exploit the inherent flexibility of air power. Target evaluation, moreover, had to consider the importance and value of the target to the enemy, the air capability to destroy the target, and the cost in loss and damage to air units to be expected in attacking the particular target. These factors had to be weighed and balanced since it was evident that FEAF would have to live within its means. While "gold targets" were quite rare in North Korea, it was possible that the solution to the targets problem would be to attack the targets which were least unremunerative. Finding lucrative targets did not promise to be easy, but the problem would not be insurmountable, once available reconnaissance and intelligence effort was directed toward that end. "It is believed," these planners stated, "that once the concept—destruction—is clearly stated and made known to all operations and intelligence agencies, targets can be found, developed, and successfully attacked."

Before FEAF could expect to secure the adoption of the strategy of air pressure, it had to provide answers to two questions of interest to the UNC ground forces: Would the enemy be able to stockpile at an appreciably faster rate if FEAF

applied its effort in a different way? What risk did the UNC take in allowing the enemy to stockpile faster? Colonels Randolph and Mayo posed these questions and proposed answers. They assumed that FEAF aircraft would, to a great extent, continue to interdict enemy movement as long as they maintained air superiority and continued to operate over North Korea. Under these circumstances the enemy would be compelled to move only by night. They did not, moreover, intend to abandon interdiction but rather to focus the air effort upon destroying materiel, killing personnel, and maintaining armed reconnaissance over the enemy's rear areas. Consideration of the risk of allowing the enemy to stockpile faster involved a realistic estimate of what the enemy would do when he accumulated a sufficiency of supplies. Inevitably the enemy was going to build up his supplies to any level which he desired: over a period of time he could do this by expending less supply than he received. But as long as the UNC maintained air superiority and the whip-hand of air attack, the Communists could not hope for ultimate victory in South Korea, no matter what their jump-off supply level might be. Just as had been the case in 1950 and 1951, an offensive would force the enemy to expose his personnel and supply lines to a violent air attack as he moved out of his prepared positions and dispersed supply dumps. The Eighth Army could be expected to preserve itself by maneuver. Back of the enemy lines, moreover, the cumulative effect of the destruction of the enemy's rail net would deprive him of fast and reliable resupply for any renewed offensive. Since the enemy could not logically expect a ground victory in Korea, the UNC had little real risk even if the enemy did build up his front-line supplies at a faster rate.

The Randolph-Mayo staff study received serious consideration in FEAF, and its recommendation that UNC air should attack accumulations of hos-

tile supplies was almost immediately accepted. General Ridgway said, for example, "that the hostile forces now opposing . . . the United Nations Command in Korea have a substantially greater offensive potential than at any time in the past."<sup>9</sup> There was thus good reason to clean up such personnel and supply targets as existed in the immediate vicinity of the front lines. On 28 April, Bomber Command was informed that the target systems considered suitable and desirable for medium bomber attack were airfields, railway systems, and supply and communications centers, in that order.<sup>10</sup> Early in May, massed Fifth Air Force fighter-bomber attacks began the destruction of hostile supplies, equipment, and personnel concentrated near the main battlefront. On 8 May approximately 485 fighter-bombers blasted a supply buildup north of Suan over a 13-hour period in the "biggest single attack since the beginning of the Korean conflict," destroying several hundred buildings sheltering personnel and supplies as well as many supply revetments, vehicles, and gun positions. On 15 May, 256 fighter-bomber sorties completely destroyed a vehicle repair factory at Tang-dong, and a third attack was made on 22-23 May in the Kijang-ni industrial area. On 22 May some 472 fighter-bomber sorties destroyed factories making hand grenades, small arms, and ammunition, while that night light bombers dropped butterfly bombs to harass salvage crews. On 23 May, 275 fighter-bomber sorties, again followed by night harassing B-26's, attacked a steel fabricating factory in the same area. Photo interpretation showed 93 percent of the first day's target destroyed and 80 percent of the second day's objective turned into ruins.<sup>11</sup> General Weyland stated that "a significant change in combat operations policy took place in May." "The scope of interdiction operations," he explained, "was expanded to include destruction of important targets, target complexes, and target systems."<sup>12</sup>

#### HYDROELECTRIC ATTACKS TEST THE NEW AIR STRATEGY

**Hydroelectric Power as an Air Target:** From the very beginning of Korean hostilities FEAF airmen had recognized the significance of the North Korean hydroelectric facilities (*see* figure 3). In North Korea the Japanese had developed one of the world's principal hydroelectric complexes. Utilizing the advantage of mountainous terrain,

they had built five power systems near the east coast of Korea, namely, Fusen, Chosen, Kyosen, and the smaller Funei and Kongosan. Large reservoirs had been dammed up on the broad, shallow, western slopes of the mountains, from which water was tunneled through the drainage divide and dropped through penstocks down the precipi-

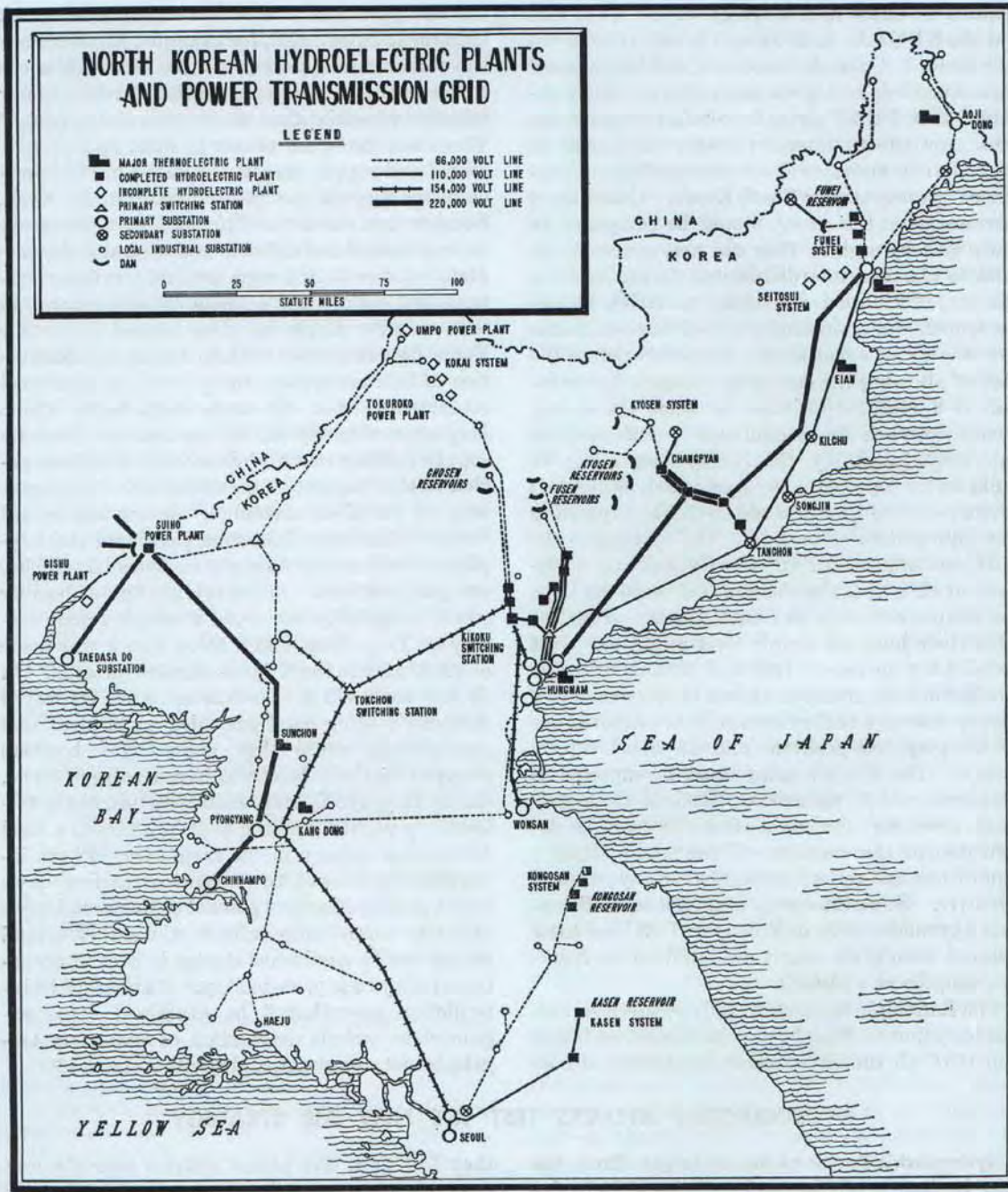


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tous eastern mountain slopes to a series of generating plants.

The oldest hydroelectric project was the Fusen complex, along the Pujon-gang River, northwest of the port city of Hungnam and furnishing power for the vast electrochemical production at that city. Second of the major systems was the Chosen, along the Changjin River, northwest of Hungnam, with four generating plants in a series ranging down the eastern mountain slope. The Kyosen system, also consisting of four generating plants and located north of Hungnam, was integrated into the eastern electric grid with Chosen and Fusen. The remaining two eastern systems, Kongosan, which was south of Wonsan, and Funei, which was near the Musan Iron Works in the Tumen area, were plants of lesser design capacity built primarily to supply local consumers. In addition to these eastern plants, the Japanese had built at Sui-ho, on the Yalu River about 30 miles northeast of Antung, the world's fourth largest power generating plant in both capacity and size. Unlike the east coast facilities, Sui-ho had an impounding dam with adjacent powerhouses, and exploited a large volume of water rather than head for its hydraulic pressure. Various scattered thermoelectric plants supplied local consumers, but their total output was a small part of the North Korean electrical production.

That this North Korean hydroelectric system had never reached its maximum designed capacity of 1,614,400 kilowatts was due to the failure of the Japanese to receive certain equipment ordered from Germany in the 1930's, the removal of generators and equipment by the Russian occupation forces in 1947, and the loss of competent Japanese technicians after 1945, but the North Korean plants nevertheless had a potential to produce far in excess of domestic requirements, for electrical power and the power surplus had been further increased after May 1948 when transmissions south of the 38th parallel had been cut off. In 1952 it was estimated that Sui-ho alone had an output of 300,000 KW, the Chosen complex of more than 200,000 KW, and the Fusen complex of over 100,000 KW. Sui-ho, the most important single installation, was transmitting about one-third of its production into Manchuria.<sup>13</sup> Following the destruction of most of the North Korean industries in the summer of 1952 the power surplus had become even larger, but the Communists had

channelled electrical power into many small shops where they repaired rail and automotive equipment, and into numerous small factories, many of them underground, which produced military items such as clothing, shoes, hand grenades, sub-machine guns, mortar shells, and small arms.

Through a strange combination of circumstances, the North Korean hydroelectric plants had become "sensitive" targets. In September 1950 FEAF target experts had noted that the electrical power industry of North Korea was the "most important target remaining" which contributed directly to the industrial and war potential of the Communist Far East. They had therefore recommended that all of the major plants, with the exception of Sui-ho which could be neutralized by destruction of its transformer stations, should be destroyed by air attack. General Weyland had directed that these targets be made available to the FEAF Bomber Command. At a FEC staff briefing on 26 September, however, one FEC staff officer had questioned the advisability of destroying plants which would have to be rebuilt when the UNC forces occupied North Korea, but General MacArthur had directed that FEAF would execute the attacks as planned.<sup>14</sup> Seven B-29's attacked Fusen No. 1 plant on 26 September 1950, but that same day the JCS, noting that UNC ground operations in North Korea were progressing favorably, directed the suspension of air attacks against such strategic targets as remained in enemy territory.<sup>15</sup>

In the autumn of 1950, when the Chinese Communists first began displaying increasing hostility, the U. S. Department of State conceived the idea that the Chinese might fear that a UNC occupation of North Korea would deny them the electrical power that they had been getting from Sui-ho, and it suggested on 21 October 1950 that the CINCUNC might well express an intention not to alter arrangements for the distribution of Sui-ho power. General MacArthur thought that this proposition was both inadvisable and unacceptable.<sup>16</sup> The belief that the Chinese were worried about the ultimate fate of Sui-ho evidently gained credence, and on 6 November the JCS prohibited "the bombing of any dams or power plants on the Yalu River."<sup>17</sup> MacArthur immediately replied that the destruction of these hydroelectric installations had "never been contemplated."<sup>18</sup> Lacking conclusive evidence as to

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what was motivating the Chinese Communists, the JCS by 9 November 1950 were willing to accept the validity of the proposition that the Chinese wished to protect their electric power sources in North Korea, possibly by the establishment of a border buffer zone in northwestern Korea. This appraisal accepted the significance of the hydroelectric plants to China: "If the Chinese Communists were prevented from obtaining electricity from these power systems, it would be a severe economic blow to Manchuria."<sup>19</sup> Seeking to reassure the Chinese, various American and United Nations officials made public statements that the dams, power plants, and distributions would not be damaged and that the current distribution of electricity would not be arbitrarily changed. On 24 November the JCS further proposed to CINCUNC that he might hold his forces in terrain dominating the approaches to the Yalu and leave ultimate handling of the extremely sensitive northern Korean provinces to the United Nations.<sup>20</sup> This course of action was completely repugnant to General MacArthur, who asserted in some heat that the importance attached to the hydroelectric facilities was "for the most part a product of British-American speculation, finding little reflection in any Soviet or Chinese utterances."<sup>21</sup>

Seeking to justify his intention to march to the Yalu, General MacArthur had perhaps underestimated the importance of the Sui-ho to China, but on 26 December 1950, when the JCS had queried him as to the desirability of destroying both the power installations and the dam on the Yalu if the Chinese crossed the 38th parallel, MacArthur replied that the power value of Sui-ho was unknown. Since highest governmental circles had announced that the hydroelectric plants would not be destroyed, MacArthur stated that "their preservation or their destruction is predominantly a political rather than a military matter."<sup>22</sup> In February 1951, when General Stratemeyer urgently requested permission to destroy the whole power complex, including Sui-ho, General MacArthur passed the request on to the JCS, only to be informed that the request could not be approved in the light of MacArthur's own information forwarded during December 1950.<sup>23</sup> In the late spring of 1951 General George C. Marshall, U. S. Secretary of Defense, explained the matter to a Congressional committee in these words: "As to

the hydroelectric plants and installations of that character, we have kept, we haven't bombed them out in most instances because their relation to . . . [the military effort] was not immediately so direct as to demand that destruction, and they always remained a possibility in negotiations."<sup>24</sup>

Comprising as they did the one major hostile economic asset still virtually untouched by UNC air action, the North Korean hydroelectric facilities were not forgotten by FEAF air leaders. On 23 June 1951 the Fifth Air Force requested that the installations be targeted, only to receive a FEAF indorsement that if cease-fire efforts failed it would seek an immediate revision of the policy restricting attacks against the hostile electric power facilities. Believing on 5 January 1952 that the truce talks had been long enough continued to warrant a revision in policy, Brig. Gen. James Ferguson, Fifth Air Force vice commander, again requested authority to attack the hydroelectric facilities. "These targets," he said, "are some of the most lucrative in North Korea, and their destruction would hinder the enemy's ability to wage war."<sup>25</sup> The commander FEAF concurred, pointing out that production could be disrupted by destroying generator facilities, transformer installations, or switching yards, without totally destroying the plants. Rehabilitation of the power complex would require qualified engineers and scarce equipment available only from the Soviet Union. He believed that it would be especially important to neutralize Sui-ho because this plant supplied power which was consumed by war-production industries in the Mukden-Dairen area of Manchuria. He pointed out that destruction of the North Korean electrical power complex "would accomplish immediate as well as long range military effects against the enemy, and would additionally create significant psychological and political effects to our advantage."<sup>26</sup> When the request came to General Ridgway on 3 March 1952, he stated that: "In the event that a decision is reached that the Communists are deliberately delaying armistice negotiations indefinitely and are increasing their offensive capabilities, your recommendations will be reexamined."<sup>27</sup>

The major stimulus for UNC air attacks against the North Korean power complex finally came from the JCS rather than, as would have been more natural, from the CINCUNC. At the direction of the JCS in the spring of 1952 USAF

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planners were surveying the problem as to what might be done if the armistice negotiations broke down. In reply to a request for information, FEAF on 29 April 1952 told these planners that the hostile hydroelectric facilities comprised legitimate and profitable military targets, which, if suddenly destroyed, would deny power to many small factories and might "impress the North Koreans with the price they are paying for their continued recalcitrance." FEAF wished to attack as soon as possible in order to deprive the Soviet-Chinese bloc of the industrial potential which the system supported and to present the Communists with a substantial rehabilitation cost; should attacks against the plants be postponed until such time as the Eighth Army was permitted to undertake an offensive, FEAF doubted that the plants could be attacked since at such a time most of the UNC air power would again be required to support the surface effort.<sup>28</sup> When, on 1 May 1952, USAF assured that the FEAF views would be fully considered in a presentation to the JCS, General Ridgway quickly rejoined that he saw no unusual circumstances whereby the JCS should direct attacks against the hydroelectric facilities rather than to follow the normal procedure of allowing the CINCUNC to make recommendations. He therefore recommended that the JCS take no action unless CINCUNC so recommended after a continuing surveillance of the targets.<sup>29</sup> While the JCS replied that Washington analyses indicated that the destruction of the targets was desirable and reminded Ridgway that, with the sole exception of Sui-ho, he already possessed authority to attack the hydroelectric plants, it assured him that further action would await CINCUNC's recommendations.<sup>30</sup>

**The Hydroelectric Strikes:** As soon as he could get the attention of the new theater commander, who was much occupied during May with Communist prisoner riots at Koje and internal troubles in the ROK government, General Weyland, on 6 June 1952, held an informal discussion with General Clark regarding North Korean electrical power. Although the "choicest plum" at Sui-ho was off-limits without JCS approval, Weyland pointed out that CINCUNC was able to order the destruction of most of the major complexes on his own authority. Getting Clark's approval, Weyland immediately ordered his operations staff to prepare briefing plans, and the resulting briefs recom-

mended joint FEAF-NAVFE air attacks, one plan including Sui-ho in the attack program, and the other excluding it. To render the four complexes inoperational would require a minimum of 610 fighter-bomber sorties and 50 B-29 sorties; getting good weather, the operations could be carried out within 48 hours. Without Navy assistance, FEAF would require an additional 24 hours for the effort. These plans were forwarded to General Clark on 11 June, with the request that FEAF and NAVFE be authorized to conduct the attacks as soon as coordinated plans could be written.<sup>31</sup>

After study of these plans at his headquarters, General Clark on 17 June directed the commanders of FEAF and NAVFE, with commander FEAF being designated the "coordinating agent," to attack as soon as possible all major electrical power complexes and separate power installations in North Korea, with the exception of Sui-ho, utilizing the closest coordination in order to attain maximum surprise and to minimize reinforcement of air and antiaircraft artillery defenses at the installations.<sup>32</sup> Receiving an information copy of this directive in Washington, the JCS determined on 19 June that the facilities at Sui-ho should also be attacked in order effectively to neutralize the entire hydroelectrical system. After the President gave his consent, the JCS authorized CINCUNC that same day to attack Sui-ho, maintaining reasonable precautions against inadvertent bombing of Manchurian territory.<sup>33</sup>

Already on 18 June FEAF had alerted the Fifth Air Force and Bomber Command for strikes against the power complexes on 23 or 24 June, these dates being selected, weather permitting, in deference to COMNAVE who wanted to have four fast aircraft carriers on the line off eastern Korea for the first time in the Korean hostilities. When Sui-ho was added to the target list, a conference on 20 June worked out the detailed coordination of the FEAF and NAVFE effort. It was agreed that FEAF was to name the time of the attack on the basis of the weather at Sui-ho and that no electric power target would be attacked until a mixed force of carrier aircraft and fighter-bombers was committed at Sui-ho. This precaution was necessary because only at Sui-ho were UNC aircraft expected to get air opposition. After the initial strike, Chosen plants No. 3 and No. 4 would be attacked by Fifth Air

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Force "turn arounds," while carrier air units attacked the Kyosen and Fusen complexes. The Chosen plants No. 1 and No. 2 would be attacked by B-29's on the night of the daylight strike. FEAF first planned to begin the strikes on the morning of 23 June but weather forecasts indicated that postponement might be necessary. During the morning of 23 June, however, target weather at Sui-ho cleared, and General Weyland, in a rapid recasting of plans, ordered an afternoon strike at Sui-ho, to be followed up on 24 June and concluded by a medium bomber attack on the night of 24/25 June.<sup>34</sup>

Beginning at 1600 hours on 23 June, 24 AD Skyraiders from the aircraft carriers *Bower*, *Princeton*, and *Philippine Sea*, escorted by 12 F9F fighters, spearheaded the assault at Sui-ho and suppressed the 44 heavy guns and 37 automatic weapons defending the area. Immediately behind the flak suppressors, 36 heavily-loaded AD's attacked the generating plant, and from 1610 to 1700 hours, 79 F-84's and 45 F-80's of the Fifth Air Force ran the bomb total up to 145 tons on target. Eighty-four F-86 Sabres provided constant top-level cover for all of the strikes and covered the withdrawal of each force. Two hours after the strikes were over, 25 F-86's escorted two RF-80 photo planes back to the target to record what had happened. The strikes at Sui-ho went off without a hitch. Flak was meager and inaccurate, not at all up to the hostile capability, and inflicted minor damage to two aircraft.<sup>35</sup> Strangely enough, the Communists offered no air opposition although 250 swept-wing MIG's were sighted at nearby Antung and Ta-tung-kou airfields just a few minutes before the strikes started. In fact, during the course of the bombing some 160 of these MIG-15's took off and withdrew into the interior of Manchuria. The most likely hypothesis for this strange action was that the enemy was unaware of the UNC target and erroneously withdrew to the rear before discovering that Sui-ho and not the Antung airfields was to be attacked.<sup>36</sup> Photographic interpretation revealed that Sui-ho, fourth largest of the world's hydroelectric plants, was at least temporarily out of operation.<sup>37</sup>

A few minutes after the attacks began at Sui-ho, the 1st Marine Air Wing struck Chosen No. 3 with 41 planes of Marine Air Group 12 and Chosen No. 4 with 38 planes of Marine Air Group 33. At

virtually the same moment, 90 Skyraiders, Corsairs, and Panthers from the *Bon Homme Richard* and *Philippine Sea* poured destruction on Fusen No. 1 and No. 2, while 52 Fifth Air Force Mustangs bombed Fusen No. 3 and No. 4. That same afternoon, 70 Corsairs, Skyraiders, and Panthers from the *Bower*, *Princeton*, and *Bon Homme Richard* hit the power plants at Kyosen.<sup>38</sup> On the following day, 24 June, the Fifth Air Force sent 30 F-80 sorties to Chosen No. 1, 70 F-51 and 12 F-84 sorties to Chosen No. 2; while other F-51's, F-80's, F-84's and Marine dive-bombers attacked Chosen No. 3 and No. 4 and Fusen No. 3 and No. 4. Task Force 77 again sent its aircraft to the Fusen No. 1 and No. 2 plants and to the Kyosen complex.<sup>39</sup> Having tasted blood, the Fifth Air Force had attacked Chosen No. 1 and No. 2, which had been scheduled for the medium bombers on the night of 24/25 June; since the B-29's had lost their target and in view of the fact that the second anniversary of the Korean war required some celebration, FEAF ordered the 25 B-29's which were bombed-up and ready to go to fly radar-directed close-support missions along the front lines at 15-minute intervals throughout the night.<sup>40</sup>

The Fifth Air Force continued attacks against Chosen Nos. 1, 2, and 3 and Fusen No. 3 on 26 June, and it again bombed Chosen Nos. 1 and 2 on 27 June. When the photography had all been analyzed on 30 June, 11 out of the 13 plants in the four major hydroelectric complexes were unserviceable. Only Chosen No. 1 was evaluated as "probably unserviceable" and Chosen No. 2 as "probably operational."<sup>41</sup> In the course of the effort the Fifth Air Force had flown 730 fighter-bomber sorties, while the F-86's had covered the attacks with 238 sorties. No casualties were sustained due to enemy action.<sup>42</sup> Although the number of sorties flown by Task Force 77 against the plants is not apparent in available reports, only two Navy planes were lost to ground fire on the two days and both pilots were rescued.<sup>43</sup>

**Evaluation of the Hydroelectric Attacks:** To NAVFE and FEAF commanders and pilots alike the three days of sustained operations against a vital target system were especially pleasing. Vice Adm. Robert P. Briscoe, who had lately taken command of NAVFE, informed General Weyland: "It was a real privilege and a decided pleasure to work with you and your command in our

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latest enterprise together. Your planning was superb. Every amplifying report indicates definite success and darker days for the enemy."<sup>44</sup> For NAVFE the hydroelectric attacks marked many first occurrences: for the first time in the Korean war four carriers were simultaneously on the line; for the first time Navy aircraft had penetrated the effective defenses of the MIG-15's; for the first time in Korea Navy and Air Force planes had made closely coordinated attacks against a single target.<sup>45</sup> To FEAF commanders, the attacks were equally gratifying. Lt. Gen. Glenn O. Barcus stated to pressmen that 95 percent of the power production of North Korea had been knocked out and predicted optimistically that the giant Sui-ho would probably never operate again so long as Korean hostilities continued.<sup>46</sup> Looking back over the Korean experience at the end of the war, General Weyland described the hydroelectric attacks as one of the "two particular strikes [that] stand out in my mind that are spectacular on their own merit."<sup>47</sup>

When the smoke cleared after the three-day hydroelectric attacks, photo reconnaissance showed that something more than 90 percent of the North Korean power potential had been put out of operation. FEAF nevertheless recognized that surveillance must be maintained and followup strikes launched to keep the plants neutralized, and, with NAVFE concurrence, it directed that the coordination of the reconnaissance and the repeated strikes would be handled between the Fifth Air Force and Seventh Fleet at the JOC in Korea.<sup>48</sup> Keeping the plants out of operation would require continued air strikes,<sup>49</sup> but by utilizing the full capability of the UNC air forces against a critical target system, FEAF had so managed the hydroelectric attacks as to inflict and then to maintain air pressure upon the Communist enemy, not only in North Korea but in the Soviet bloc.

There was no doubt that the Communists attached great significance to the source of an important part of their hydroelectric power. The rapidity with which the Reds dispatched scarce Russian and Chinese technicians to the ruined plants bespoke their importance.<sup>49</sup> According to agent reports an almost complete power blackout prevailed in North Korea for 15 days after the

June strikes; after this time the production of small thermoelectric generating plants plus some limited use of the lesser damaged hydroelectric plants restored electric power to perhaps a static 10 percent of the former capacity.<sup>50</sup> Other agent reports confirmed FEAF's prediction that the loss of electric power would either stop or curtail war production in many small factories, themselves so dispersed as to be impracticable air targets. Loss of electric power greatly hindered vehicle and rail equipment repairs since electric welders could no longer be used; rice merchants reportedly complained that they could not get their rice milled; and farmers who used electric pumps to irrigate paddy fields had to depend upon other resources.<sup>51</sup>

Intelligence reports received from Manchuria indicated that the neutralization of Sui-ho represented a loss of 23 percent of the 1952 power requirements in northeast China. As a result of power shortages 30 out of 51 key industries in the Port Arthur, Dairen, Funchun, and Anshan areas failed to meet their 1952 production quotas and four were 75 percent or more in arrears. Various short-term measures, including staggering of shifts and alternate day and night operating schedules, along with such long-term measures as procurement of small generators for allocation to plants and mines and the construction of new thermoelectric generating stations were attempted by the Reds in an effort to make up some 120,000 KW lost at Sui-ho, but by December 1952 these various expedients had provided only a fraction of the deficient power requirement.<sup>52</sup>

Although the North Korean hydroelectric power facilities were military targets, were located within North Korea, and no violation of Chinese or Russian territory was even alleged, the June air attacks were met with vehement protest from British Laborites, the Labor Party now being the minority in the British Parliament. Labor Party leaders Clement Attlee and Aneurin Bevan denounced the bombing in Commons speeches on 24 June as provocations which might lead to a third world war. Prime Minister Churchill insisted that there was no change of policy in Korea but admitted that he had not been consulted prior to the hydroelectric raids. What made the attacks doubly galling to the British was that the British Defense Minister, Lord Alexander of Tunis, had visited General Clark in Tokyo to discuss greater coordination of British-American

<sup>44</sup>See Chap. IV, pp. 100-102, 120, 132.

effort just before the strikes; he had been informed that they were impending but had departed the Far East before the last-minute decision was made to add Sui-ho to the target list. In informal discussions, Clark had already told Alexander that the appointment of a British general officer to the UNC staff might be productive of better Anglo-American liaison and understanding.<sup>53</sup> The announcement by Churchill on 1 July that such a British staff deputy would be appointed did much to clear the controversy, and on the same day a Labor motion criticizing Churchill's failure to "secure effective consultation" on Korean air operations failed of adoption in Commons. On 28 July, Maj. Gen. Stephen N. Shoosmith, then in charge of the Army Staff of the British Joint Staff Mission in Washington, was appointed as the British deputy at the UNC headquarters in Tokyo.<sup>54</sup>

Concurrently with these British criticisms, the JCS received queries from members of the U. S. Congress asking why the North Korean power

plants had not been bombed earlier. Asked to comment on the matter, General Clark replied that it was his "personal opinion that the power installations in North Korea have been profitable military targets for attack at any time since the intervention of the Chinese Communists into the Korean war." Clark noted that FEAF and NAVFE press releases had emphasized the military aspect of the targets without implying any change in UNC policy other than a mild suggestion "that the raids could be interpreted by Communists as gentle hint of more to come if the Communists want it that way."<sup>55</sup> The official Secretary of Defense reply to Congress, however, stressed the military nature of the targets and said that military considerations had forestalled destruction of the targets until June 1952. The result of the British controversy and the queries from Congress was again to inform the Communists that the UNC intended to fight a limited war. "Once again," noted FEAF, "the persuasive threat of air power had been lessened."<sup>56</sup>

#### REDEFINITION OF THE UNC AIR STRATEGY

**Statement of FEAF Operational Policy:** In view of the fact that both Washington and London had announced that there had been no change in policy in Korea, FEAF had some reluctance in admitting that there had been any change in its basic combat operations policy. Having observed the massed air attacks of May and June which marked the initiation of air pressure operations, USAF on 25 June sent out a query as to whether FEAF had changed its policies. The FEAF combat operations division replied that basically there was no change in policy but that "there had been a change in the weight of effort expended against various targets occasioned by several factors including increased concentration of enemy defenses, reports of increased troop concentration and supply build-ups along the battle line and enemy rear areas, and necessity for varying tactics to force the enemy to disperse his defenses."<sup>57</sup>

Such circumspection may have been justifiable, but on 26 June the FEAF Target Committee proposed that the FEAF combat operations policy should at least be rewritten sufficiently to direct the Fifth Air Force and FEAF Bomber Command to maintain air pressure through destruction operations rather than to continue with the old

policy of delay, disruption, and dislocation. General Weyland approved the recommended action, and within the next two weeks representatives of the FEAF intelligence and operations deputies matured a new policy directive.<sup>58</sup> Even before this directive was issued, however, General Smart cautioned the FEAF Formal Target Committee "to keep in mind that this modification is not a major change in policy, but rather a shift in emphasis from delay and disruption operations to destruction."<sup>59</sup>

As issued to the Fifth Air Force and FEAF Bomber Command on 10 July 1952, the new FEAF operational policy directive reflected a change from the old emphasis upon delay and disruption and ordered the selected destruction of enemy supplies, equipment, facilities, and military personnel. The new air attack program recognized three factors. The first was that the Communists had amassed in the Far East considerable air power which could be employed offensively against UNC forces at any time. The second was that the major sources of enemy supply were off-limits to UNC air attack and the enemy pipeline from the sanctuary to the front lines was relatively short. The ground front in Korea, moreover, had

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been so long stable that enemy resupply requirements were low. Thus the obstruction of enemy supply movements in Korea could not prevent the enemy from gradually building up his supply stockpiles. The third factor was that friendly ground forces in a stabilized ground situation did not require great amounts of close air support.

In order to exert the maximum pressure against the Communist forces in North Korea, FEAF air effort was to be employed with first priority given to the maintenance of control of the air. Secondly, other combat air effort as available would be employed to accomplish the maximum selected destruction in order that the Korean conflict should be made as costly as possible to the enemy in terms of equipment, supplies, facilities, and personnel. Third, such air operations as were feasible would be conducted to reduce the immediate threat to UNC forces posed by Communist ground armies. Direct air support would be provided to UNC ground forces as required by the initiation of friendly or enemy offensive ground action. As a general principle, the scope and tactics of air employment would be constantly monitored to assure that all units were kept at a high level of combat readiness. The air attack program would also include provisions to assure crew proficiency in any type mission which they might be required to fly in a future emergency or a renewed ground action.

As long as there was no major change in the tactical situation in Korea, the major proportion of air attack effort would be employed in destruction operations. The following priority listing of target categories was specified: (1) aircraft, (2) serviceable airfields, (3) electric power facilities, (4) radar equipment, (5) manufacturing facilities, (6) communications centers, (7) military headquarters, (8) rail repair facilities, (9) vehicle repair facilities, (10) locomotives, (11) supply, ordnance, and POL, (12) rail cars, (13) vehicles, (14) military personnel, (15) rail bridges and tunnels, (16) marshalling yards as facilities, and (17) road bridges. The selection of specific targets for attack would have to be made with a consideration to the relative listed priority, the vulnerability of the target to air attack, and the defenses of the target. Within the target categories all sources of information would have to be exploited to search out and identify the most lucrative objectives. The possibility of developing

lucrative objectives was to be exploited, and sufficient attack against the enemy rail system would be employed both to develop targets such as locomotives and rolling-stock concentrations and to assure that the system was not rebuilt to such an extent that it could support extensive sustained enemy ground operations.

Close coordination between the Fifth Air Force and FEAF Bomber Command was essential in order that fleeting targets developed by destruction attacks were followed up with the least practicable delay. Since it had the more flexible capability, the Fifth Air Force was assigned the responsibility for exploiting fleeting-type targets. The Fifth Air Force was also given responsibility for maintaining air superiority in Korea, but Bomber Command was instructed to attack such airfields as the Fifth Air Force recommended and FEAF directed. Bomber Command would normally apply its efforts against communications centers, manufacturing facilities, rail bridges, and concentrations of supplies and rail cars. Such targets, however, could also be attacked by the Fifth Air Force.<sup>60</sup>

**Development of the Air Pressure Strategy:** While the FEAF operational policy directive of 10 July 1952 remained in effect during the remainder of Korean hostilities, it actually provided no more than the bare bones of the air pressure strategy. In some measure the directive was even unrealistic: the targets list, for example, accorded radar equipment the fourth priority for air attack, obviously because such equipment was expensive to the enemy and its destruction would hinder hostile interceptions of UNC aircraft, but the Fifth Air Force was never able to perfect an adequate technique for locating and attacking these pinpoint targets.\* Locomotives and vehicles were accorded low attack priorities, yet it would be found practicable to concentrate these elusive targets and to attack them with a large measure of success. In the state of hostilities prevailing in Korea, moreover, FEAF would get desirable results from an intensification of its air effort against targets which were actually of little importance. Attacks against "sensitive" targets in the vicinity of the Yalu were found to have a degree of profit which was quite apart from the value of the target. The FEAF Formal Target

\*See Chap. VII, pp. 248-51.

Committee therefore ignored the target listing when necessary and built an air strategy upon the philosophy of the policy directive, which required FEAF "to accomplish the maximum selected destruction in order that the Korean conflict is made as costly as possible to the enemy."

This air strategy which was to develop would display a sound recognition of the Communist political situation. It recognized that North Korea was in utter political subordination to, and militarily dependent upon, Red China and Soviet Russia. Any final decision regarding armistice terms would be made by China and Russia, and the effects of the air pressure attacks within North Korea had to be made to be felt by the senior partners in the Soviet conspiracy. The FEAF planners reasoned that the destruction of the North Korean hydroelectric facilities would not only impress the North Koreans with the price that they were paying for continued recalcitrance but would deprive the Sino-Russian bloc of the important industrial potential which the system supported. They reasoned correctly that to rehabilitate the destroyed North Korean power system the Russians would have to divert scarce technicians and electrical equipment from their own resources, thus delaying the Soviet Union's own programmed domestic electrical power expansion.<sup>61</sup> In this and other destruction operations, FEAF intended that the direct effect of its air pressure in North Korea would be "felt as far as Moscow."<sup>62</sup> The Communist armies in Korea constituted a huge outlay of Red capital: FEAF reasoned that if these armies were held to an indecisive defensive employment and concurrently destroyed by air action, the Communists would not long continue to argue about truce terms. FEAF air pressure, moreover, could cause the Chinese to make demands upon the Russians for additional military equipment, which the latter might not be able to supply; hence, air pressure promised to strain Sino-Soviet unity.

From their outset, however, the air pressure operations had one serious limitation: only targets directly related to the hostile military structure and its immediate support could be attacked. General Smart nevertheless planned that "whenever possible attacks will be scheduled against targets of military significance so situated that their destruction will have a deleterious effect upon the morale of the civilian population actively engaged

in the logistic support of the enemy forces."<sup>63</sup> During the latter stages of World War II, Twentieth Air Force B-29's had dropped warning leaflets announcing the names of Japanese cities to be attacked and advising civilians to leave those cities. Morale surveys made soon after the Japanese surrender had shown that these announcements had undermined the people's faith in the ability of their government to defend them, had caused whole populations to flee the proscribed cities, thereby seriously interfering with war work, and had persuaded many Japanese civilians of the good intentions of the Americans.<sup>64</sup> Psychological warfare planners at FEAF on 1 July 1952 recommended a specific warning program which was designed to exploit the psychological effect of the air pressure operations.<sup>65</sup>

The necessary psychological warfare leaflets were prepared by the FEC psychological warfare agency. In support of the massed air strikes directed against military targets in Pyongyang on 11 July 1952,\* FEC psywar plan BLAST was employed. The day before the bombing, 150,000 leaflets expressing the theme of "Bomb Warning" were dropped over the North Korean capital, and five days after the attack 150,000 leaflets with the theme of "General Civilian Bomb Warning" were released in the same area. The written text of both of these leaflets urged civilians to stay away from military installations of any kind because all such military targets would be bombed.<sup>66</sup> Visiting in Seoul on 14 July, Gen. J. Lawton Collins, chief of staff of the U. S. Army, told newsmen that the Yalu and Pyongyang raids had seriously crippled the Reds' ability to start an offensive and added that they "haven't a ghost of a chance of driving us out of Korea." In Tokyo on 15 July, General Collins warned that even heavier bombings were in store for the Reds if they "insist on prolonging the war."<sup>67</sup>

Preparatory to the initiation of light bomber attacks against communications and supply centers in North Korea,† the FEC psychological warfare agency implemented plan STRIKE. Beginning on the night of 13 July aircraft dropped leaflets entitled "You are Next," containing a map of northwest Korea with the main supply routes outlined in red and warning that all military targets along these routes were going to be attacked.

\*See Chap. IV, pp. 98-99.

†See Chap. IV, pp. 99-100.

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These leaflets were carefully directed at 78 towns in North Korea known to house Communist military installations and supplies. Designed for dropping in an area after an air attack had taken place was another leaflet, entitled "You were Warned," which was designed to impress civilians with the credibility of UNC leaflets.<sup>68</sup> General Barcus announced to the press on 5 August that 78 North Korean towns had been warned of impending attack and that his B-26 bombers had already made night attacks against supplies in two of these towns. Just prior to these attacks against Sinchon and Yonan, both being towns in the Haeju peninsula area, leaflets had been dropped advising the civilians to clear the vicinity, and Radio Seoul had broadcast spot announcements right up to the moment of the attack warning civilians that their town would be bombed that night. Subsequent to the attack the follow-up leaflets had been dropped, informing all concerned that they had been adequately alerted and that other strikes would doubtlessly follow.<sup>69</sup>

While these warnings were both humanitarian and utilitarian—they enabled civilians to save their lives and disrupted Communist civil order and war-work schedules—the U. S. Department of State on 5 August stated that it deplored the warnings as "an unfortunate move" which would be intensively exploited by Communist propaganda. In a message to the American Embassy which was passed to CINCUNC, the State Department noted that Oriental audiences were particularly vulnerable to such psywar since they tended to see the use of massive airpower as the symbol of "western technology domination" of Asia and as reminiscent of methods used by the Japanese. No matter how it was handled, the State Department message said, the subject of massive bombings of military targets in or near heavily populated areas could not be useful to UNC purposes. The main theme of a moderate number of "hard stories" should best be that targets for UNC air attack were selected on a strictly military basis and that air action was not being aimed at the civilian population.<sup>70</sup>

The JCS did not prohibit the use of warning leaflets, but it emphasized on 8 August that air pressure attacks should be directed against mili-

tary targets and that all justifications of air actions would have to be based solely on military grounds. The JCS further stated that it was "considered important to avoid public statements ascribing the high level of air activity as bringing pressure on the Communists to agree to an armistice, so that Communist prestige is not so seriously engaged as to make more difficult ultimate Communist agreement to an acceptable armistice."<sup>71</sup> The rule that air power could be applied only against military targets had prevailed from the beginning of the Korean hostilities, but these actions in August 1952 greatly circumscribed FEAF's plan to utilize its air power so as to disrupt North Korean civil order. General Clark subsequently issued a general rule that: "Every effort will be made to attack military targets only, and to avoid needless civilian casualties."<sup>72</sup> The directive of 8 August, moreover, deprived psywar of a potent theme that the Communists could resolve the air pressure laid against them by the simple agreement to accept voluntary repatriation of prisoners of war, the only armistice issue still outstanding.

The determination of what was a "military target" and what comprised "needless civilian casualties" would give FEAF much trouble in the spring of 1953 when a target study identified North Korean irrigation dams as an exceptionally lucrative air pressure target system.\* At this time General Weyland felt himself morally compelled to rule that these dams could not be attacked for the purpose of destroying the North Korean rice crops, and he permitted air strikes against only those dams whose released flood waters would wash away rails and military supplies. At the end of the hostilities in Korea, however, General Weyland observed that "the policy of attacking only targets directly related to the military structure and its immediate support may be completely invalid for another situation." If the nation under attack were a flagrant international criminal, or if the friendly ground forces were not committed during the air campaign, or if the air forces were completely investing the enemy by air, Weyland said that "the systems chosen for attack might be, and possibly would be, quite different."<sup>73</sup>

\*See Chap. IV, pp. 126-31.

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## Chapter III

## CONTROL OF THE AIR OPERATIONS

Air superiority operations under the limited combat conditions of the Korean hostilities did not resemble similar air operations in the past, nor were they likely to be typical of the future. The story of how the UNC air forces controlled the air in Korea nevertheless provides one more historical justification for the overriding priority which USAF doctrine accords to the air superiority mission.

During the first few weeks of Korean hostilities FEAF as a matter of first priority easily destroyed the small North Korean Air Force. Once accomplished the achievement of UNC air superiority paid large dividends; yet the very fact that FEAF initially seized and continuously thereafter maintained air superiority over North Korea with a minimum commitment of forces could lead to a mischievous misconception that the feat could be duplicated at will in some future conflict. In a war with a major power the aerial superiority which FEAF obtained so easily in Korea would be dearly purchased at a cost of pilots, planes, and an all-consuming air effort. After the defeat of the NKAF, the UNC owned the air to the Yalu, but here air superiority ended because under no circumstances could UNC aircraft violate the sanctity of the Manchurian borders. The UNC, in fact, maintained an artificial foul line three miles south of and parallel to the Yalu River, beyond which UNC aircraft could not fly without special authority.

As they were free to do because of the UNC politico-military rule which confined air hostilities to Korea, the Communists rebuilt their air order of battle behind the Yalu, bringing it up to a magnitude which threatened the survival of UNC forces in Korea. At such a time as the CINCUNC could state that Communist air operations imperiled the security of his forces in Korea, the

JCS indicated that it would consider air attacks against enemy air bases outside Korea,<sup>1</sup> but this situation never arose. After November 1950, however, Communist MIG-15 jet interceptors attacked UNC aircraft over North Korea, and within a year these speedy fighters had gravely hazarded the slower models of UNC aircraft and had prohibited day-time medium bomber operations over northwestern Korea. By June 1952 the Communists had built over northwestern Korea a coordinated air defense system which employed fighters, antiaircraft artillery, searchlights, and radar control. The degree of effectiveness with which FEAF countered this defense system—by day and by night—would be a major factor affecting the success of the UNC air pressure operations.

What intelligence there was of enemy motives indicates that the Communists did not utilize their Manchurian-based aircraft against UNC airfields and installations in South Korea primarily because they correctly judged that this would be to invite UNC reprisal attacks. By a corollary rule, however, the Communists reasoned that if they could rehabilitate or build air facilities south of the Yalu they could base air units there which could attack UNC positions. From time to time the Reds did succeed in staging light plane sneak attacks against UNC positions, always at night. These heckling attacks, mounted from North Korea, demanded that the Fifth Air Force devote constant attention to the air defenses of its base installations. The Communist air potential north of the Yalu similarly demanded that the Fifth Air Force plan a base defense which could weather an all-out Red attack.

Withering FEAF fighter-bomber and medium bomber neutralization strikes prevented the Reds from building and repairing air facilities in North



Korea during 1951. While the continued neutralization of these facilities remained a primary objective of the air pressure strategy, the status of these Red airfields in North Korea after April 1952 came into context with the truce negotiations. At such time as an armistice was about to be effected, UNC air would have to neutralize all of these fields and thus prevent the Reds from bringing a last-minute air order of battle into North Korea.\*

Under the FEAF air pressure policy directive, the first priority of air effort was accorded to those

operations necessary to maintain a friendly control of the air over North Korea. Such a priority had been in effect since June 1950, but until July 1952 the primary mission of Fifth Air Force Sabre wings had been not to kill Communist aircraft as a major endeavor but rather to shield and protect slower UNC aircraft. The air pressure planners recognized that Red aircraft represented a significant value to the Communists, and they therefore directed that enemy aircraft and airfields would have the highest priorities for destruction under the new strategy.

### GROWTH OF COMMUNIST AIR CAPABILITIES

**Augmentation of Red Air Strength:** The strangest phenomenon of the initial phase of Korean hostilities was that the North Korean Communist forces who invaded in June 1950 should have been so excellently equipped with Russian armor and ordnance, so well reinforced with Chinese-trained foot soldiers, and yet so meagerly supplied with Soviet aircraft. In June 1950 the NKAF had possessed no more than 122 old conventional combat aircraft and some 30 other miscellaneous planes, including trainers. The Reds had evidently expected that the United States would not intervene in Korea, in which circumstance the NKAF would muster superiority over the 16 liaison and trainer aircraft possessed by the Republic of Korea. Exactly the reverse was true and within a few weeks FEAF had sought out and destroyed the NKAF.<sup>2</sup>

The Chinese Communists did not repeat this mistake, and they did not commit their ground troops until they had augmented their air force. As early as 14 February 1950 a Sino-Soviet aviation agreement had been concluded looking toward the "reconstruction" of the Chinese Communist Air Force. Under the terms of this agreement, the USSR apparently undertook to sell China as many as 3,000 training and combat aircraft, to provide China with advisory and technical assistance, and to deliver as many as one-fourth of the firstline aircraft by December 1950. China was to let the Russians use any new Chinese airfields,

\*While these UNC airfield attacks were tactically a part of the control of the air operations, they were most significant as the culmination of the air pressure campaign. They are therefore discussed in their chronological position within the air pressure campaign. See Chap. IV, pp. 135-40.

and the CCAF was to become "one integral part of the Russian air force."<sup>3</sup>

By November 1950, when the Red Chinese ground troops intervened in Korea, the CCAF had begun to get substantial deliveries of aircraft and was growing. FEAF intelligence in December 1950 estimated that the Chinese had some 650 combat aircraft, including 250 conventionals and jets, 175 ground-attack planes, 150 twin-engine conventional light bombers, and 75 transports. The once-destroyed NKAF was also rebuilding behind the Yalu and FEAF credited it with possession of at least 60 Yak-type fighters. In addition, some 400 to 500 Soviet Air Force planes at bases around Dairen could be made available for use in Korea.<sup>4</sup>

By June 1951 FEAF estimated that there were 1,050 combat aircraft in China, including 445 jet fighters. Some 690 of these combat planes were based in China's northeast military district adjacent to Korea.<sup>5</sup> The FEAF estimates of Chinese air strength rose to 1,255 planes on 1 September 1951, the additional aircraft being MIG-15's and bringing the total of these jet fighters up to 525.<sup>6</sup> By June 1952, China's 22 air divisions had been built up to a strength of 1,830 aircraft, including 1,000 jet fighters. Sixty percent, or 1,115 of the total aircraft, was massed within Manchuria.<sup>7</sup> In the meantime the Russians had also been strengthening their own air units in the Far East, and during the first half of 1952 the Soviet air units had reached and stabilized at a strength of approximately 5,360 aircraft.<sup>8</sup>

After June 1952 the combined Communist air order of battle in the Far East remained approximately stable at 7,000 aircraft, roughly 5,000 of

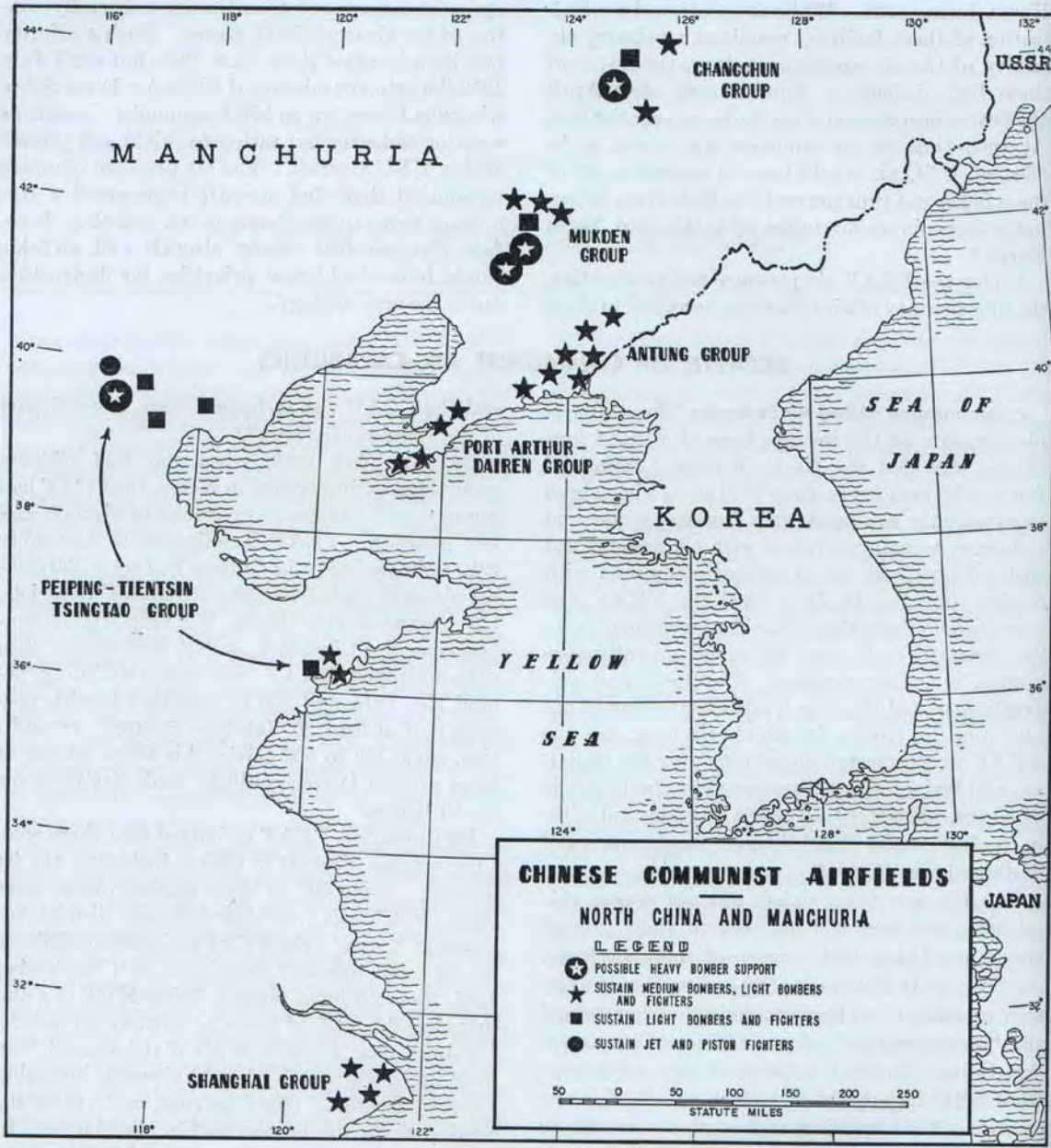


Figure 4.

them belonging to the Soviet Union, a little less than 2,000 of them to the CCAF, and some 270 of them to the rehabilitated NKAF. In the last year of Korean hostilities, the Soviet bloc continued a vigorous modernization program, replacing conventional aircraft in units with modern jet types. In November 1952, for example, FEAF learned that the CCAF had acquired modern IL-28 light jet bombers and had stationed them in Manchuria. Two of these new IL-28's were first sighted along the Yalu on 17 December 1952, and in January 1953 FEAF estimated that the CCAF possessed 100 of these aircraft.<sup>9</sup> Shortly before the end of the Korean hostilities, enemy military aircraft in Manchuria were estimated to total 1,485 planes, including 950 jet fighters, 165 conventional fighters, 100 IL-28 jet bombers, 65 conventional light bombers, 115 ground-attack planes, and 90 transports.<sup>10</sup>

**Construction of Communist Airfields:** Concurrently with their buildup of aircraft, the Chinese constructed or expanded their air facilities in their northeast military district, on the Kwantung peninsula, and on the coastal areas of north China (see figure 4). These air facilities lay in a large arc which topped and ran along the left flank of the Korean peninsula. Of chief interest to FEAF, since it directly supported MIG-15 operations over northwestern Korea, was the Antung base complex. Here, within sight of UNC aircraft patrolling south of the Yalu, Red interceptor forces were initially based on the main airfield at Antung and on operational bases at Ta-tung-kou and Ta-ku-shan. Eventually the Reds built other airfields at Kuan-tien, Feng-cheng, Tapao, and Kachiapa. Antung was the logistical center and main base, but MIG's were based at five of these fields, each of which was capable of supporting continued operations of up to 300 fighter aircraft.

Six major airbases in the Mukden area defended this significant industrial complex and additionally provided back-up and dispersal facilities for the Antung complex. From 100 to 200 miles northeast of Mukden were four other active airfields, each of which had been rebuilt in 1950 and 1951. These fields provided depth and flexibility for defensive units and were probably used for moving aircraft between Siberia and the South Manchurian bases. On the Kwantung peninsula a dozen various type bases, of which four were particularly

important, provided local defense and served both CCAF and Soviet air units, the latter being maintained there to protect Russian leaseholds. On 16 July 1952 a MIG-15 from one of these bases (probably Dairen) made some 15 passes against a Fifth Air Force RB-26 which was flying weather reconnaissance over the Korean Bay. Flanking the southern extremities of both Korea and Japan were the Chinese bases in the Peiping-Tientsin-Tsingtao group of fields and in the Shanghai complex.

By USAF standards most of these major CCAF airfields were relatively poor installations, mainly because they lacked extensive facilities for servicing and maintaining aircraft. The Chinese nevertheless indicated that they could accept much lower standards of flying safety and personnel comfort and still operate on a fairly large scale.<sup>11</sup>

In addition to these facilities which were forbidden to UNC air attack, the Communists had some 35 airfields in North Korea, nearly all of which were unserviceable and kept that way by UNC bombings. Only the airfields at Uiju and Sinuiju, both being immediately across the Yalu from Antung, were customarily kept operational, and these two airfields were virtually a part of the Antung complex and did not appreciably extend the southward range of Red aircraft. These 35 Korean airfields would have to be completely neutralized by UNC air action prior to an armistice.\*

**Communist Antiaircraft Artillery:** At the beginning of the Korean conflict, only a meager amount of Red antiaircraft artillery was deployed in North Korea, and antiaircraft artillery units were the poorest equipped organizations in the NKPA. For defense of ground forces in the field each NKPA division had 18 x 12.7-mm. Soviet machineguns; for the defense of the rear areas, the North Koreans reportedly possessed a total of approximately 20 x 76-mm. Soviet AAA guns of World War II vintage. As late as September 1950, the only significant grouping of AAA was at Pyongyang, where the addition of a battalion of 85-mm. Soviet AAA guns raised the total weapons deployment to 33 pieces.<sup>12</sup>

From such modest beginnings the Reds built up their antiaircraft artillery: the flak order of battle increased from a total of 252 guns and 673 automatic weapons in May 1951 to 720 guns and

\*See Chap. IV, pp. 135-40.

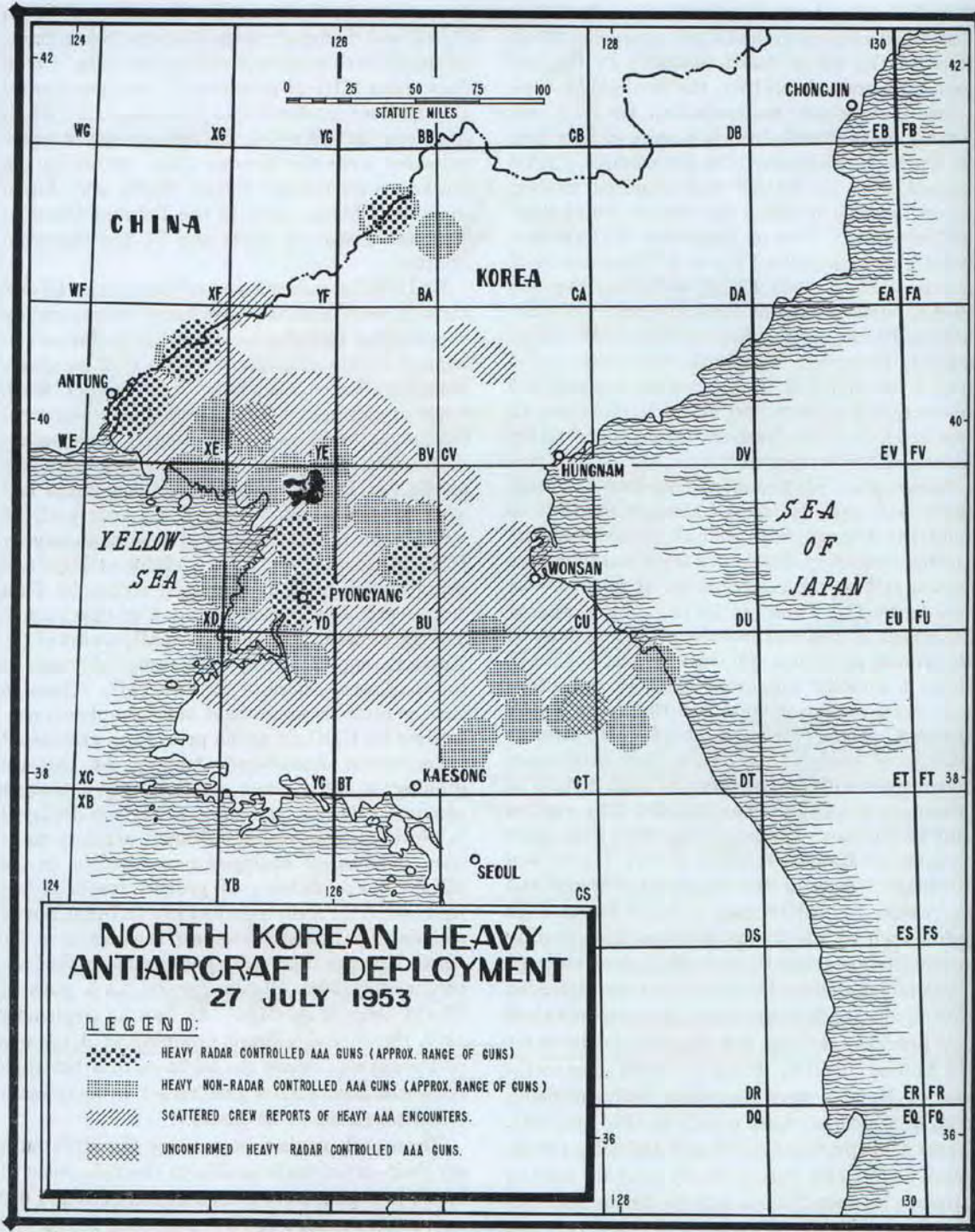


Figure 5.

922 automatic weapons at the end of hostilities. Why it was so was not entirely clear, but the Communist flak order actually peaked well before the end of hostilities and then tapered downward to the July 1953 totals. A major addition of guns was observed in the last quarter of 1952 so that by the end of February 1953 the total of heavy guns was 786. Accompanying the guns were gun-laying radars which in May 1951 numbered 20, increased to 26 in February 1953, and then stood at 22 when the war ended. The mobile automatic weapons demonstrated a great fluctuation: they reached a high of 1,672 pieces in January, then dropped to 1,088 in mid-April 1952, climbed to 1,584 in May 1952, and then again declined downward to a low of 1,077 in mid-November 1952, built up to 1,304 at the end of December 1952, and then dropped steadily off to stand at 922 at the end of hostilities.<sup>13</sup>

Although the Reds moved their flak in context with the UNC air objectives, heavy AAA guns, of which the Soviet 85-mm. with an estimated effective service ceiling of 25,000 feet was the foremost type, most of the gun-laying radars, and a part of the automatic weapons were usually concentrated around various critical installations in northwestern Korea. The most heavily defended areas were customarily the Pyongyang complex, the Sinanju bridge complex, the Sui-ho dam, the Antung-Sinuiju area, and Manpojin (see figure 5). Although Pyongyang City and the Antung-Sinuiju area had semblances of all-around defenses, the usual Red deployment was to put the AAA defenses in close vicinity to the target being defended, which meant that UNC aircraft could get into the target but had no possibility of evading the hostile fire once over the objective. Although the amount of enemy anti-aircraft artillery gave the impression of strongly defended areas, Communist AAA defenses in comparison with World War II standards were weak and incapable of denying UNC aircraft access to target areas. While light weapons concentrations bothered the Fifth Air Force a great deal, Bomber Command aircraft, operating above 18,000 feet, generally met meager flak. "As a matter of fact," stated General Fisher, "we can fly anywhere in North Korea under any weather conditions with little concern for flak except on the Yalu River."<sup>14</sup>

Lacking enough gun-laying radars to go around and compelled to use day fighter aircraft in a night

fighter role, the Reds made extensive use of searchlights, eventually displaying about 500 of them, some of which were radar controlled. From 20 to 30 searchlights were customarily deployed around Antung-Sinuiju, the Sui-ho dam, Pyongyang, and the Sinanju bridge complex, but anywhere north of the Chongchon River there were enough searchlight belts so that a night-flying aircraft stood a good chance of being picked up and illuminated (see figure 6). On clear nights the searchlight beams ranged up to 30,000 feet, and enough of them had radars or sound control mechanisms to pick up and track an aircraft until other visually directed lights could switch on and cone the plane. Sometimes these lights were revetted in protective emplacements, but the usual Red practice was to keep them mobile and moving from place to place.<sup>15</sup>

**Red Warning and Control Establishments:** Prior to June 1950 the North Koreans were operating early-warnings (EW) radars at Chongjin, Wonsan, and Pyongyang, and when the MIG-15's began to operate, early-warning and ground-controlled intercept (GCI) sets were sited around Antung. The Communist radar network eventually included a confirmed 25 EW and 11 GCI installations whose electronics emanations could be noted but not pin-pointed by UNC electronics reconnaissance. Hostile early-warning coverage ultimately extended well south of the 38th parallel, and the hostile GCI was most effective along the west coast of Korea and particularly so within a 90-mile radius of Antung, where in the spring of 1953 a CPS-6 type radar, evidently of recent Soviet manufacture, was established. Over northeastern Korea (east and north of the Chosen reservoir) there was no GCI coverage except for a 90-mile radius of coverage out of Vladivostok, where the Russians had a GCI.<sup>16</sup>

The actual number of Communist radars in North Korea was greatly out of proportion to the need for them: in almost every instance facilities were duplicated, usually by a different type of equipment. At first this was thought to be a countermeasure against UNC jamming, but a later speculation was that the Russians, Chinese, and North Koreans each manned separate radar systems designed to assist pilots of their nationality who flew in combat. Equipment employed for the most part included old Japanese radars, old German Freya sets, old U. S. or British SCR-527's,

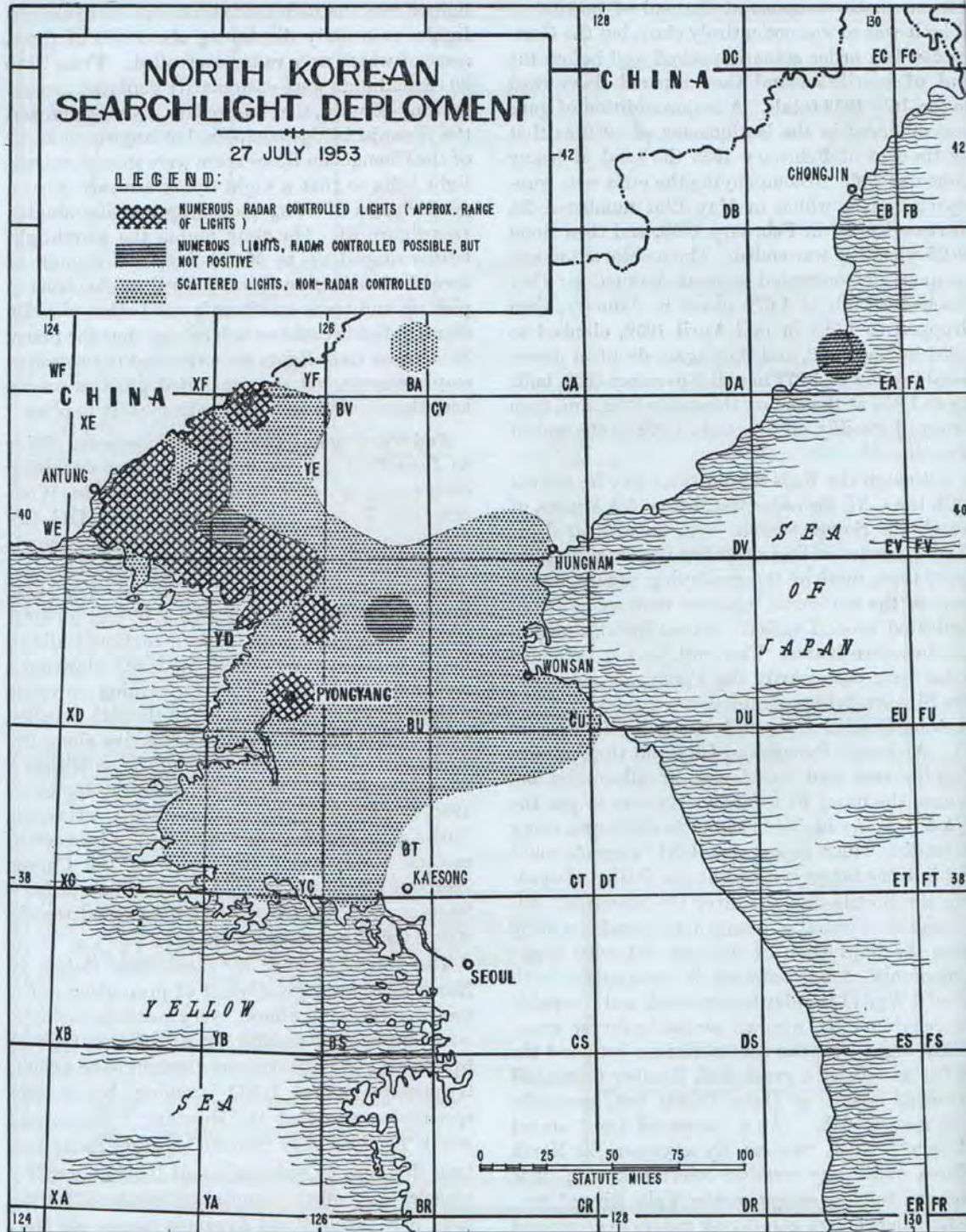


Figure 6.

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and a small amount of more modern Russian equipment.<sup>17</sup>

Utilizing the Red air order of battle based in Manchuria and receiving information from the radars, an "allied joint headquarters" at Antung, staffed by CCAF and NKAF personnel, exercised day-by-day control of Communist air employment in Korea, including the commitment of aircraft to combat. The "supreme joint headquarters" of the Chinese Communist and North Korean forces in Shengyang (Mukden) apparently functioned in air matters chiefly as an administrative headquarters, and Red pilots appear to have been unaware of the existence of the Mukden headquarters. The operations center at Antung doubtlessly received orders of general instructions from Mukden, but top-level management of ground-controlled interceptions was reportedly at Antung. Although the Antung JOC appeared to be managed by the Communist Chinese, one source reported that it was actually run by Russian advisors who were present in the control rooms at all times.<sup>18</sup>

#### Communist Aircraft and Aircrew Capabilities:

Figured in terms of theoretical aircraft performance, the Communist air forces after November 1950 possessed an increasingly serious capability against the UNC. Backbone of the Red order of air battle was the MIG-15, which had been designed to fill the role of a high-speed, high-altitude interceptor against bomber attacks. Although primarily a defensive weapon, the MIG's heavy-caliber armament system could find ready use in ground attack. A crashed MIG-15 recovered from the coastal waters off North Korea by a combined Fifth Air Force and Seventh Fleet expedition in June 1951 had bomb shackles and electrical circuits for bombing.<sup>19</sup> According to theoretical calculations of FEAF intelligence, however, the MIG-15 possessed a limited potential as a fighter-bomber because of existing distances in Korea. From Antung to the battle line was 270 miles and to Seoul was 290 miles. These distances fairly well ruled out use of MIG-15's for bombing so long as they were based around Antung, because a late-type MIG-15 with internal fuel and two 550-pound bombs was figured to have a combat radius of only 135 miles. FEAF intelligence figuring estimated that the best range of a MIG would be with one 550-pound bomb and one 70-gallon external tank and would be 265 miles, or

perhaps 295 miles if no fuel reserve was retained for emergencies.<sup>20</sup> A more likely proposition was that MIG's would escort TU-2 conventional light bombers: without external fuel tanks the MIG could go approximately 245 miles, or with internal fuel plus two 70-gallon external tanks it could fly some 415 miles.<sup>21</sup> All of these computations were based on standard USAF flight profiles, but as FEAF cautiously pointed out there was little likelihood that the Reds would use USAF profiles, in which case "the limited-range MIG-15 is not so limited as we once thought."<sup>22</sup>

After November 1952 the chief hazard to UNC ground installations in South Korea was no longer the MIG-15, which at best had a dubious ground-attack capability at distances so close to its range limits, but the force of 100 IL-28 light jet bombers which the Communists had gotten into Manchuria. These modern bombers were promptly reported as "the greatest present threat to FEAF," for the IL-28 could fly a normal profile to a maximum radius of 690 miles with a two-ton bomb load.<sup>23</sup> Its speed of 400 knots promised to make an IL-28 vulnerable in daylight attacks, even with MIG escort, but it also had a night attack potential. The presence of these bombers in Manchuria enhanced the possibility of a major night sneak attack against Fifth Air Force bases in Korea.<sup>24</sup>

When the fog of war had cleared and FEAF had secured and tested the latest type MIG-15BIS aircraft, it would become evident that this airplane did not represent as great a threat as had been imagined,\* but even during the course of hostilities it was quite evident that the major limitation on the employment of Communist air power was the caliber of its pilots. As met in the air over northwestern Korea, Communist pilots were either very good or more usually very poor, and there was no moderately skilled but capable medium grade. "We've placed the MIG pilots into two classes, the 'Honcho' or professional and the 'Students,'" stated Col. John W. Mitchell, commander of the 51st Fighter-Interceptor Wing, who added: "We can always tell which one we are up against. . . . When we hit the 'Students' we have an easy time of it, but when we run into a 'Honcho' we know immediately that we've got to exert every bit of skill and technique at our command to set this bird down."<sup>25</sup>

\*See pp. 52-53.

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Although the nationality of the "honcho" or "boss" pilots could never be exactly proved, there was little real doubt that they were Russians. Such was reported by covert intelligence sources, and from time to time enemy pilots who bailed out were visually seen to be Caucasians. The NKAFF flight leader, Lt. Ro Kum Suk, who defected with his MIG-15BIS in September 1953, simply assumed that everyone knew that Russian, Chinese, and North Korean pilots had flown in Korea.<sup>26</sup> Unmarked but unmistakably Russian MIG's rose from bases around Vladivostok to intercept Task Force 77 aircraft on 18 November 1952 when they attacked Hoeryong, near the northeastern Korean border.<sup>27</sup> Whatever their nativity, these "honcho" pilots could be easily identified by their proficiency, by the way they flew formation, and by their aggressiveness. Sabre pilots frequently encountered these particularly skilled adversaries accompanying MIG formations as instructors, and other such pilots were evidently rotated through Korea in units.<sup>28</sup>

The masses of MIG-15 pilots were "raw recruits." Each "class" of new pilots appeared to be rotated through a six- to eight-week training cycle which followed a regular pattern: the new class generally flew high and fast, in large formations, was neither aggressive nor proficient, and usually declined to engage the Sabres. In such a period the Sabres scored few kills. As training progressed, the MIG pilots flew at lower altitudes, became a bit more aggressive and proficient, and engaged the Sabres in fairly well-planned tactics. In this period Sabres scored more kills. In the final period the Red trainee pilots reached their peak of proficiency and aggressiveness, flew at altitudes more open to active combat, and engaged the F-86's more frequently. Sabre kills were frequent in this period. Then the class evidently rotated, and a new class came in, once more flying high and in large formations.<sup>29</sup> By the end of each of these training cycles, the trainee pilots had improved but they were never as good as their instructors: Sabre pilots commonly referred to the large straggling, training formations as "jackpot flights," meaning that if they could just get into the formation they could reap a wealth of destroyed aircraft.<sup>30</sup>

When the Communist neophyte pilots could be brought under attack they were apt to display utter confusion. Some forgot to drop their ex-

ternal tanks, others fired their guns wildly at nothing in particular, and many ejected from the their aircraft without particular provocation. Flight tests would later confirm combat observations that the MIG was not very stable at high altitudes or in high speeds, and this instability was aggravated by panic-stricken trainee pilots, who yanked at the stick to evade, applied too much power, and threw their planes into uncontrollable spins.<sup>31</sup> In May 1953 one MIG pilot ejected from his plane as he was approaching a Sabre headon, before either plane came within firing range.<sup>32</sup> Bursts of tracers in front of a trainee pilot was often enough to make him break off.<sup>33</sup> In combat, moreover, MIG pilots would seldom break into an F-86 when attacked: Lt. Ro explained that the Red pilots knew that to break would expose their cockpits to fire, whereas, by absorbing the fire in the engine and armor plate behind them, the MIG pilots found that they had an excellent chance to recover, or at least safely to bail out after the F-86's had broken off.<sup>34</sup>

**Communist Air Strategy:** Under the circumstances which existed in the peculiar Korean combat, the Communists chose to employ their air forces primarily in a defensive role. This was not because the Communists did not recognize the importance of controlling the air: viewing Korean hostilities in retrospect in the late summer of 1951, a Chinese Communist general staff delegation which visited Korea reported that the Red attempts to secure a ground victory had failed because of a lack of air superiority. The delegation predicted that the United States could not be defeated in Korea unless its "air supremacy" was first destroyed; the outcome of the Korean fighting, they said, could well be determined not on the ground but in the air.<sup>35</sup>

The major reason for the Communist failure to launch air attacks from north of the Yalu, as General Weyland believed and stated, was because they operated "under restrictive directives to reduce the likelihood of retaliation."<sup>36</sup> That this assessment was exactly correct was borne out in the report of the Chinese general staff delegation, which bitterly observed: "The United States has repeatedly declared that any attempt by the Red air force to bomb the U. S. troops would be retaliated with relentless bombing of the North-eastern Provinces by the USAF. For this reason, the Red China air force has not dared to make

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such an attempt in the past and it may not make it in the future. The conservative policy adopted by Red China has apparently ensued from the high-handed policy of threats of the enemy." This report further stated that the UNC policy of avoiding border violations "could be construed as similar to our avoiding bombing the area south of the 38th parallel."<sup>37</sup>

If the Chinese could have rehabilitated Korean airfields to a degree permitting them to move their air units forward, they would have doubtlessly attempted air attacks against South Korea. But, having lost air superiority over North Korea, the Chinese in 1951 were taught the "basic lesson that an air force cannot be reconstituted or developed in an area where his foe has won air superiority."<sup>38</sup> These efforts to base Communist air units in North Korea were not entirely out of respect for the international border but in a great measure they represented a recognition of the short-range (until November 1952, when the IL-28's arrived) capabilities of the CCAF and NKAF. The first conclusion of the Red Chinese general staff delegation was that China required long-range attacking air power. This group expressed great dissatisfaction with the limited range of the MIG-15 fighter: based at Antung, they asserted, a MIG-15 could attack ground targets no further than 100 miles distant. Thus to extend operations over UNC positions required bases in North Korea, but each effort to build such airfields was thwarted by UNC air attacks, leading the delegation to conclude that airfield construction in the combat area was "a burden far beyond the financial power of Red China to support." This delegation suggested that Russia ought to send China mostly Yak-15's, whose range and performance was more like the USAF F-84. The delegation stated that the MIG-15's, although provided in generous numbers, were not suitable for use either in Korea or in Indo-China and would probably be of limited value against Taiwan.<sup>39</sup>

Other reasons suggest themselves as to why the Communist air forces did not attack UNC installations in South Korea to any appreciable extent. The over-all proficiency of Communist pilots was so poor that the Red air command could expect high casualties in any sustained offensive.<sup>40</sup> For a Red aircraft to be shot down over UNC territory, moreover, would compromise both the plane and the pilot. Probably out of respect for this same

phobia against compromise, Communist pilots also refused prior to February 1953 to fly any distance out over the Yellow Sea, even in pursuit of a disabled UNC aircraft.<sup>41</sup> When a knowledgeable North Korean lieutenant colonel, captured as an enemy agent in May 1953, was interrogated, he confirmed this deductive reasoning: MIG pilots, he said, did not generally fly south of the Chongchon River because they were unqualified for unlimited aerial combat and prohibitive loss was feared, because there were no suitable emergency landing fields in the forward areas, because there was always danger that a MIG would fall into UNC control, and because there was danger that definite proof would be given that Russian and Mongolian pilots were flying some MIG's.<sup>42</sup>

The foregoing reasoning—some of it deductive but most of it based on intelligence evaluations—would indicate that the Reds were attempting to make the best of an adverse air situation in Korea. They may well have hoped that sooner or later the MIG masses would attrite and wear out the inferior numbers of Sabres. These explanations of Communist air strategy, however, do not completely satisfy the whole course of Korean air events. Never altruistic but proverbially frugal with her material resources, Russia in the three years of the Korean war built up a Chinese air force of respectable proportions with modern combat types and at the same time provided replacements for at least 827 MIG-15's lost in combat. Why did the USSR, whose doctrinaire leaders generally work from long-range plans, support such a costly and seemingly unprofitable venture? Three plausible answers emerge: by supporting China, Russia got access to airfields stretching from the Arctic to Indo-China, she built a satellite air force for eventual united employment, and she enjoyed the unique opportunity afforded by the Korean conflict for testing equipment and training personnel.<sup>43</sup> "The MIG . . . and its equipment," surmised FEAF intelligence as early as March 1951, "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." As hostilities wore on, the course of air events continued to indicate the existence of a far-reaching Soviet plan to utilize a substantial portion of the air combat in Korea in preparation for some future war. Quite unlike World War II, when Soviet air units had been

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chiefly concerned with ground support, the Reds used their aircraft in Korea in an air superiority mission, and Communist air commanders may well have had a directive to devise air superiority tactics and to develop fighter-interceptor cadres—sacrificing quality for quantity.<sup>44</sup> This theory goes far in explaining seemingly erratic and unorthodox Communist actions in the air battle. MIG's often ignored fighter-bombers, but they always attempted to intercept medium bombers. Not frequently MIG formations tried against Sabre fighters tactics which obviously were intended for use against bombers: in January 1953, for example, flights of MIG's would fly in trail parallel to a flight of Sabres and then suddenly turn into line abreast and make a simultaneous fir-

ing pass through 2,000 yards range, then climb high and turn back across the Yalu. Against fighters this tactic was hardly effective, but such tactics had been used by ME-109's against bombers over Europe in World War II.<sup>45</sup> In February 1953 the Seoul TACC frequently observed coming south of the Chongchon MIG tracks which immediately withdrew when Sabres were sent out: the supposition was that the enemy was probing UNC radar defenses and testing scramble reactions.<sup>46</sup> These and other similar experiences made it evident that the Communists were working out the mechanics—command, staff, maintenance, supply, and related problems—of a sizeable counterair efforts against the best of United Nations airpower.<sup>47</sup>

### AIR-TO-AIR COMBAT OVER NORTH KOREA

**Limitations on Sabre Combat:** Under the circumstances of a normal war the Fifth Air Force would have been directed to destroy enemy aircraft wherever found within the operating range of its aircraft, in the air or on the ground, but in Korea the politico-military rule that UNC aircraft could not cross the Yalu precluded attacks against MIG's while they were parked on their Manchurian bases or while they were flying in their vulnerable take-off and landing patterns. In Korea, Fifth Air Force air superiority activities were virtually limited to such air-to-air fighting as the Red chose to sustain by sending their aircraft across the Yalu. Possessed with the initiative of joining or refusing combat, and remaining callously indifferent to the fate of their ground comrades in Korea, the Red air commanders attempted constantly to devise situations which would give maximum advantages to their pilots.

With infrequent exceptions, the Reds chose to make the northwestern quarter of North Korea the scene of their counterair operations (*see* figure 7). 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 was the area popularly called "MIG Alley." Why the enemy liked to fight in this locality was easy to understand, for here he had the maximum of geographic advantages. Based at the Antung complex of air-

fields, his short-range MIG interceptors could be quickly alerted and could take off, form up, climb to superior altitude, and maneuver for a speedy penetration southward, all the while remaining within the Manchurian sanctuary. After making speedy passes against UNC aircraft in "MIG Alley," the Reds could break off pursuit merely by crossing the Yalu barrier. At one time in December 1950 the JCS had been willing to permit UNC interceptors a few minutes of "hot pursuit," in which they could chase the Communist bandits across the Yalu, but several of the allied nations had objected and the proposition was dropped. In March 1953, when there were newspaper reports that American pilots were pursuing Communist aircraft across the Yalu as a matter of common practice, the JCS directed CINCFE to take measures to insure that its instructions were fully complied with. CINCFE reported, in turn, that UNC pilots were conscientiously breaking off engagements at the Yalu, even though this practice allowed many MIG's to escape. He admitted that in the heat of combat it was likely that some border violations had occurred but emphasized that they were not common practice.<sup>48</sup>

North of the Chongchon River the light, specialized MIG interceptors held most of the advantages over heavier all-purpose UNC fighters, who had not only to fly some distance to reach their targets and patrol stations but also had to retain sufficient fuel for their return to base. When they saw fit to give combat, the Red airmen

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almost always possessed a numerical superiority, and UNC aircraft faced superior numbers of MIG's ranging anywhere from an occasional 60 to 1 down to normal 3 to 1.

In part the numerical superiority of the MIG's was permitted by the enemy's fortunate tactical situation, but no small part of the advantage in numbers was due to the fact that the Communists simply had more MIG-15's than the UNC had day-interceptor aircraft, of which the F-86 Sabre was the foremost type. On 31 May 1952, for example, the 4th and 51st Fighter-Interceptor Wings had 139 Sabres; on 31 December 1952 they had 163; and on 31 July 1953 they had 181 Sabres. Counting F-86 fighter-bombers, which could double as interceptors when needed, the Fifth Air Force at the end of hostilities had 319 Sabres assigned to units.<sup>49</sup> In addition to the Sabre force, the Fifth Air Force used the RAAF 77th Squadron's Meteor-8's as day interceptors until January 1953, when these jets, clearly outclassed by the MIG's, were converted to fighter-bomber work.<sup>50</sup> At any time after November 1950 the Communist MIG-15's far outnumbered the Sabres.

Never large in terms of aircraft, the Sabre force's operations were additionally limited by the necessity of living within never-plentiful logistical means and by the requirement that 75 percent of all aircraft had to be maintained in combat ready status against the day that they might be needed to meet a sudden Communist onslaught. In their peak month of Korean operations—May 1952—the Sabres flew 5,138 effective sorties, but thereafter F-86 sorties had to be cut back to balance with logistical support, and October 1952, when 4,261 F-86 sorties were flown, was the highest month of Sabre interceptor activity in the last twelve months of the Korean war.<sup>51</sup> Improving logistical support in the autumn of 1952 actually allowed the Fifth Air Force to increase its planning factor for Sabre operations above that which had been predicted by FEAF,\* and the F-86 interceptors were each permitted to fly a maximum of 29.6 sorties monthly. Unfavorable flying weather in the winter of 1952-1953 caused stand-downs or limited operation, with the result that the Sabres flew at a sortie rate of 21.18 missions per month.<sup>52</sup> This lower than maximum sortie rate was also a result of General Barcus'

\*See Chap. I, p. 23.

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policy of conserving air effort: "this is not the time to do or die for dear old Rutgers," he told the Sabre pilots, promising at the same time, "I'll let you know when the time comes, and then I will expect the very best of everything that you have."<sup>53</sup>

**Performance Comparisons of MIG and Sabre:** "I have often been asked how the F-86 compares to the MIG-15," commented General Weyland, who then answered: "In my opinion, when all variables are balanced out, I believe the F-86 is the better airplane—at least for our purposes."<sup>54</sup> Comparisons of MIG and Sabre performance in combat were complicated by the fact that three models of Sabres—F-86A's, F-86E's, and F-86F's—saw duty against at least two models of MIG's—the basic MIG-15 and the MIG-15BIS, the latter's suffix meaning "encore" and denoting an improved model. In the given tactical situation in Korea, however, performance comparisons involved a fundamental equation that the MIG-15, a light airframe with a powerful engine, possessed certain advantages over the F-86, a heavy airframe with a powerful engine. What the Sabre pilots in Korea would have liked to have had was a small, lightweight, highly maneuverable, day-fighting air superiority fighter,<sup>55</sup> but since no such aircraft was immediately obtainable USAF gave the highest developmental priorities to functional improvements on the existing F-86.

When the 4th Fighter-Interceptor Wing began combat in December 1950 it was equipped with F-86A model aircraft, the original production version of the Sabre. This aircraft was powered by a J-47-GE-13 turbojet engine which delivered a maximum thrust of 5,200 pounds. The last of these original production models would not be phased out of the theater until October 1952, but replacements of the F-86A with the F-86E model Sabres on a one for one basis was begun in July 1951. The F-86E, however, was essentially the same aircraft as the F-86A with the exception that it had an all-movable horizontal tail surface and power-operated controls, improvements which made for better handling at high Mach but added over 500 pounds to the weight of an already-heavy aircraft. Until mid-1952 these Sabres fought two models of MIG's: the basic MIG-15, which had an LK-45F engine (a copy of the British Nene II) delivering 5,000 pounds thrust, and the improved MIG-15BIS, powered by a 6,000 pound-thrust Soviet-designed VK-1 engine.<sup>56</sup>

Apparently both MIG models were in action as early as the spring of 1951, and according to pilot reports either model MIG-15 was generally superior in performance to the F-86E. The MIG could consistently outclimb F-86's at all altitudes, with its rate-of-climb advantage becoming more apparent at higher altitudes. Below 20,000 feet the difference was not so great but the MIG could still pull away from the F-86 in a sustained climb; above 30,000 feet the MIG's superiority of climb was particularly obvious; at 45,000 feet the MIG could chandelle away from a Sabre. It was generally agreed that the MIG could at least initially out-accelerate 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 sustained 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. 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, demonstrated an ability to out-turn the MIG at altitudes below 30,000 feet; Sabre pilots correctly guessed that this was due to timidity of the MIG pilots. At 40,000 feet and above, however, the F-86 would stall when trying to turn level with a MIG. One of the chief MIG advantages was its service ceiling: 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 could be held in a 6-plane formation at 50,000 feet or higher. In summary, the flight performance of the MIG over the F-86A or F-86E was definite above 35,000 feet, marginal above 25,000 feet, and nil below 20,000 feet.<sup>57</sup>

Combat observations convinced Sabre pilots that the MIG-15 was aerodynamically capable of flight at Mach numbers as high as the F-86, while its structure was so much lighter that its ratio of power-to-airframe weight permitted it a superior performance. In October 1951 the commander of the 4th Group therefore filed an unsatisfactory report on the J-47-GE-13 engine. To enable the Sabre to match performance with the MIG, he said, the Sabre's airframe weight required an engine delivering a minimum of 6,500 to 7,000 pounds of thrust. In December 1951 the USAF accordingly stated the requirement for the development of such a more powerful engine, but for the Korean operations it could furnish nothing better than the recently developed J-47-GE-27 engine, which surpassed the thrust of the -13 by more than 700 pounds to develop a maximum of 5,910 pounds of thrust under full military power. Already this engine was being incorporated in production model F-86F's, which otherwise were little changed from the F-86E series aircraft.<sup>58</sup>

The first F-86F's received in the Far East arrived in June 1952 and were used to equip the 51st Wing's new 39th Squadron. Beginning in September 1952 the 4th Wing's 335th Squadron also received these new model aircraft. When retrofitted with an extended leading edge wing,\* the F-86F greatly reduced the various advantages previously enjoyed by the MIG. Maximum operating altitude jumped to 52,000 feet, an increase of 4,000 feet over the earlier Sabre's ceiling. Maximum Mach number went to 1.05 and at high altitudes the F86F with extended leading edges was able to make tighter High-G turns, evidencing over the older Sabre models a superiority of maneuverability which meant much when thrown against the agile MIG. The F-86F was also approximately 8 to 10 knots faster than the F-86E in level flight and exceeded the earlier plane's rate of climb by 200 to 300 feet a minute.<sup>59</sup>

As a general rule, the MIG could still out-accelerate, out-climb and out-zoom the F-86F, but this aircraft, with its extended leading edge wings and greater thrust engine, was able to get up into the higher altitudes at which the MIG had formerly operated with comparative impunity.<sup>60</sup> Since the F-86F interceptor models were in short supply, these planes were initially segregated into

\*See p. 56.

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two squadrons to simplify operations and maintenance, but in March 1953 this arrangement had to be broken up and the aircraft redistributed throughout the squadrons of both wings; the reason was that pilot morale was suffering in the squadrons which were equipped with older model Sabres. The 335th Squadron, between 1 October 1952 and 1 February 1953, had scored 81 MIG kills while the other two squadrons in the 4th Wing had turned in a combined total of only 54 MIG kills, the difference being attributed "solely to the F-86F type aircraft . . . being flown by the 335th."<sup>61</sup> When the F-86F Sabre proved to be superior, FEAF made arrangements whereby all its F-86E's would be exchanged over a period of months for F-86F's possessed by the USAF Air Defense Command. Although delayed by difficulties met in processing the -E's for shipment to the United States, the exchange program was well underway by the end of hostilities, at which time the 4th and 51st Wing possessed respectively 60 and 62 F-86F aircraft against their unit authorizations of 83 Sabres.<sup>62</sup>

During most of the Korean war, Sabre pilots generally argued that the MIG was an aerodynamically stable aircraft in flight; many of them cited instances where they had fought their controls while chasing MIG's which appeared to have no similar problems.<sup>63</sup> Before the fighting had finished, however, there were a good many pilot reports that the MIG was unstable at high speeds, subject to unintentional spins, especially at altitudes above 35,000 feet, and very difficult to bring out of a spin. During 1951 and 1952, 32 instances were reported in which a MIG was observed to go into a spin for causes other than battle damage.<sup>64</sup> In a shorter but more intensively watched period between September 1952 and April 1953 there were 24 instances of MIG spins—12 of which were assessed as accidental and 11 of which resulted in losses to the enemy.<sup>65</sup> In the first half of May 1953 when there were seven incidents in which the enemy went into inadvertent spins from maneuvers at or above 35,000 feet and in most instances the pilots immediately ejected, FEAF commented that: "A new, inexpensive, highly efficient 'MIG KILLER' technique has been found."<sup>66</sup>

Taken as a fighting weapon—an amalgamation of maneuverability and ability to deliver destructive fire—combat observations demonstrated that the MIG did not achieve the stature of the Sabre.<sup>67</sup>

Of excessively heavy caliber, insufficient in number, and too slow in rate of fire by USAF standards was the standard MIG-15 armament: one 37-mm. gun in the lower right nose and two 23-mm. guns in the lower left nose. The Russians, however, habitually preferred heavy caliber armament in all their aircraft, and the guns were well suited for the destruction of bombers at high altitudes.<sup>68</sup> At the high rates of speed and fast closures of combat between jet fighters, the combined cyclic rate of the six 50-caliber M-3 machineguns mounted in the Sabre was approximately four times that of the MIG armament. Battle damage statistics, moreover, indicated that the superior terminal ballistics of the heavier MIG armament did not compensate for its lower cyclic rate, shorter firing time, and resultant lower hit probabilities.<sup>69</sup> The cone of dispersion and rate of fire of the MIG armament was similarly too large for fighter-against-fighter combat, although several unlucky F-86's were lost simply because they inadvertently flew into the heavy caliber fire.<sup>70</sup> While there was some evidence of experimentation, MIG armament remained characterized by a low rate of fire and a definitely inferior fire direction system throughout the hostilities in Korea.<sup>71</sup>

Most of the foregoing combat observations relative to the performance of the MIG-15 aircraft were validated when FEAF secured a late-model MIG-15BIS aircraft through the defection of a North Korean pilot, who flew his plane to Kimpo on 21 September 1953. This "Kimpo MIG" was carried by air transport to Okinawa where a team of specialists from the Wright Air Development Center (WADC) gave it flight performance tests. At best, the MIG-15 was pronounced to be "a usable weapon for high-altitude interception of modern bombers." Its desirable features were: (1) an ability to operate at altitudes above 50,000 feet; (2) a high rate of climb; (3) a rapid horizontal acceleration from relative low speeds; (4) a short turning radius, which Red pilots were reluctant fully to exploit because of poor accelerated-stall characteristics; and (5) a short takeoff and landing distance requirement. The MIG's undesirable features were: (1) loss of aircraft control at high Mach numbers; (2) loss of vision caused by inadequate defrosting of canopy and windshield; (3) poor lateral-directional stability at high altitudes; (4) low rate of roll; and (5) poor aircraft control at high indicated air speeds.

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In short, the undesirable features of the MIG-15 greatly outweighed its good points.<sup>72</sup>

**MIG Actions and Sabre Counter-Tactics:** "Tactics that are successful in the morning may be obsolete in the afternoon," noted the 51st Fighter-Interceptor Wing study on tactical doctrine.<sup>73</sup> The truth of this observation was due largely to the fact that the Sabres were seldom permitted a free rein to devise the most effective methods of destroying MIG's; instead, the Sabre forces usually had to devise and employ the tactics which would most effectively counter such tactics as the MIG pilots cared to employ.

In the course of 32 months of air-to-air combat over Korea the Communists demonstrated a learning process in the employment of their jet fighters. Beginning on 1 November 1950 and continuing through January 1951 small formations of MIG's appeared intermittently in small sections, seldom venturing more than a few miles south of the Yalu, their usual tactics being hit and run passes against UNC aircraft. As the Red strength increased between February and April 1951, MIG's were frequently engaged over the Sonchon-Taechon area, still well within the relative safety of "MIG Alley." Their common tactic was a high stern attack made out of the sun by elements of two MIG's who would dive down firing and immediately zoom back into the sun. During May and June 1951 the MIG's edged down to the end of "MIG Alley," being frequently encountered over Sinanju and showing themselves to scattered observations as far south as Pyongyang. If the Red pilots now believed that they had sufficient strength to stop hugging the Yalu, they nevertheless still sought security in superior numbers. Introduced to cover this situation was what the Sabre pilots called a "Yo-Yo" Communist tactic, in which 20 or more MIG's orbited at an altitude superior to a UNC formation, and on signal elements of MIG's would peel off, preferably from up-sun, and come in high astern, fire through the pass, and then zoom back up into another pool of orbiting MIG's.

In the late summer and autumn of 1951 the Communists made their bid for air superiority in tactics employing superior numbers of inferior pilots in maneuvers calculated to encircle and overwhelm the UNC air forces. Day after day the enemy committed more than 100 MIG's in pincer and envelopment tactics: often a force of 60

to 80 MIG's crossed into Korea in the vicinity of Sui-ho on a southeastern heading, dropping off flights or small sections to engage UNC Sabre patrols north of the Chongchon. As the main "train" continued southward, scouting forces for flank patrols went over toward Wonsan. Timed to coordinate, another similar "train" proceeded out of Manchuria down the west coast of Korea, also dropping off pockets of resistance and dispatching scouting flights to Chinnampo and Chodo Island. Over Pyongyang the main forces converged, dropped down to 15,000 to 20,000 feet and then swept back northward looking for fighter-bombers, homeward-bound Sabres, or stragglers. A fresh section of MIG's usually came as far south as Sinanju at high altitude to cover the withdrawal. These pincer and envelopment tactics were well thought out, but the caliber of the Communist pilots was not good enough to execute them. When the MIG's got outside "MIG Alley" and operated at lower altitudes, the Sabre force (augmented by the conversion of two squadrons of the 51st Wing in December 1951) scored a good number of kills: 13 in September, 24 in October, 25 in November and 28 in December.<sup>74</sup>

In the latter part of January 1952, after the Sabres had destroyed a record number of 31 MIG's during the month, the Reds broke up their "trains" in favor of more aggressive and smaller formations, which usually remained north of the Chongchon and flew at both high and low altitudes, a few flights being directed against the Sabre screen and larger numbers of Red aircraft attempting to strike UNC fighter-bombers. Enemy attacks against the fighter-bombers numbered 8 in January, 6 in February, 10 in March, 9 in April, and jumped to 25 during May 1952. With two exceptions, all of these attacks were made while the fighter-bombers were attacking rail targets between the Yalu and the Chongchon. Considering the number of times they tried to attack the fighter-bombers, the Red airmen were not notably successful: only 8 of this type aircraft were lost in air-to-air action between January and June 1952. For their aggressiveness and willingness to engage, however, the MIG pilots paid a heavy toll: the Sabres in April 1952 turned in what was up to then a record claim of 44 MIG's destroyed. In May the Sabres destroyed 32 MIG's. Probably in context with their losses, the Reds severely curtailed their MIG operations in June and July 1952.<sup>75</sup>

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In the period prior to mid-1952 the F-86 pilots had fought the MIG's under conditions which lent every advantage to the Communist aircraft, but they had nevertheless devised tactics to suit the situation. These tactics have been discussed in more detail in an earlier study,\* but briefly they included special escort where needed, with the majority of Sabre effort going into a Yalu River sweep or screen, flown twice daily so long as the 4th Wing was the only Sabre organization and four times daily when the 51st Wing secured Sabres. The fighter-bombers timed their strikes to coincide with the Yalu screens. Basic tactics used for screening included a "jet stream" formation, whereby Sabre flights were dispatched at close intervals, arriving in "MIG Alley" at diverse altitudes, times, and headings. In order to locate higher flying MIG's by their contrails, the Sabres stacked the screen up just under the contrail level. When one flight located MIG's, it called out the fact and all Sabre flights closed to give battle. The optimum flight composition was the "fluid four," comprising four F-86's, spaced generally in fingertip formation. Quite early the Sabres discovered that they could not dawdle in "MIG Alley," and they therefore habitually entered the combat zone at the highest speed at which flight integrity was possible: at least Mach .85 and preferably above .87 if there was danger of enemy attack. The jet-stream tactics exploited both mass and flexibility, brought both security and economy of fuel, and, with each 4-Sabre flight operating on its own, increased the normal aggressiveness of the individual Sabre pilot. High-speed cruising gave the slower-accelerating Sabres a chance to save themselves if bounced by the MIG's. These fundamentals of the jet-stream, fluid-four, and high-speed cruising permitted optimum utilization of the F-86 aircraft under the local situation of the time in North Korea.<sup>76</sup>

Until the middle of 1952 both the MIG's and the Sabres had operated over North Korea with little, if any, assistance from electronics control. The Communists had, of course, benefited from early-warning radar, but it was not until 18 May 1952 that two MIG's dropped down out of an overcast against a flight of Sabres, indicating that the Reds had begun to employ ground radar to control and vector their aircraft into the most favorable posi-

\*See AHS-72, pp. 111-16.

tion for an interception.<sup>77</sup> In May 1952, as a result of an effort which had begun some months earlier, the Sabres also began to get electronics assistance. As early as the autumn of 1951 Fifth Air Force electronics officers had desired to site radar eyes on Cho-do Island, just off the western coast of Korea and some 125 miles behind enemy lines. Doubt as to the security of the island and transportation difficulties in moving equipment ashore there delayed the Cho-do project, but a detachment of the 606th Aircraft Control and Warning Squadron (later assigned to the 608th AC&W Squadron) got on the air at Cho-do with an SCR-270 early-warning radar on 12 February 1952. This set gave good coverage of Red aircraft landing and taking-off at the Antung complex, but it had no ability to control friendly fighters.<sup>78</sup> The Fifth Air Force therefore directed on 1 May 1952 that a small tactical air direction center (TADC) would be located on Cho-do, and that same month a lightweight AN/TPS-1C was flown to the island. Results were immediately good for in May the Cho-do Dentist Charlie radar furnished the information required to vector F-86's to six MIG kills.<sup>79</sup> Particular attention was given thereafter to improving the GCI capability at Cho-do Island, with the result that the TADC there would function admirably during the remainder of hostilities.†

Although the UNC attacks against the Sui-ho hydroelectric plant went unopposed on 23 June, the Reds brought their more skilled pilots into action during July 1952. At the same time that the FEAF was getting seriously down to business with its air pressure campaign, the Communist air arm brought out a new and effective technique. In this endeavor the Reds used scattered MIG formations, a part of the MIG force engaging or luring off the patrolling Sabres, whose location was obviously pinpointed by Communist GCI radar, while other MIG's penetrated or flew around the ends of the Sabre screen at moderately high altitudes. On 4 July, when UNC aircraft attacked the North Korean Military Academy near the Yalu, some 90 MIG's were observed in the area, and at least two strikes got through the Sabre screen to make unsuccessful attacks against the fighter-bombers. The MIG's positioned themselves well enough but they lost kills because of poor gunnery and eager-

†See p. 82.

ness. In the course of the engagement, 13 MIG's were claimed destroyed at a loss of two Sabres.<sup>80</sup> As a result of this experience and in view of the need for a change in tactics as the fighter-bombers switched to targets of more importance, the Fifth Air Force made modifications in the old, generally free-lance Yalu barrier patrols which had fixed a screen of Sabres between UNC fighter-bomber targets and the MIG airfields. Beginning in July the Sabres were required to place more stress on visual contact with and flying top cover for the fighter-bombers. More escort missions were now required for the reconnaissance aircraft which sought out and photographed targets deep in enemy territory.<sup>81</sup>

By August 1952 the Communists were giving evidence that they were severely galled by the UNC air pressure campaign. Nam Il stated at the truce conference table on 11 August that the UNC had "brazenly attempted to apply the so-called 'military pressure' and carried out wanton and indiscriminate bombings of our peaceful towns and inhabitants." He warned the UNC negotiators that "any so-called 'military pressure' on your side will only invite you to miserable defeat."<sup>82</sup> Evidently stung into action by the intensified FEAF operations and having benefited by a period of reduced activity since April, the Red air forces surged back into action on 1 August as if by signal. Once again the majority of the Red pilots were getting combat experience and displayed reluctance to tangle, but other MIG's employed end-runs, decoys, and "Yo-Yo" tactics. The major aerial battle of the month was fought on 6 August between 52 MIG and 35 Sabre pilots, resulting in the destruction of at least 6 MIG's. The increase in the tempo of the air-to-air war in August permitted the Sabres to destroy a total of 33 enemy aircraft.<sup>83</sup>

The most intense aerial engagements since the beginning of the Korean hostilities took place in September 1952. The major air duel of the month occurred north of the Chongchon on 4 September, when 39 F-86's met 73 MIG's in 17 separate engagements. The MIG pilots were aggressive and displayed good tactics, but the F-86's destroyed 13 of the enemy planes at a loss of 4 of their own number. On other occasions in September, however, the MIG's demonstrated an ability to break through or evade the Sabre screens. On 1 September, eight of them got down to Haeju

where they bounced and damaged a Mustang. On 9 September, some 175 MIG's effected a well-planned defense of the North Korean Military Academy near Sakchu: part of the MIG force engaged the Sabre cover while some 77 other MIG's prosecuted 12 attacks against the fighter-bombers, destroying three F-84's and forcing three flights of them to jettison their bombs. In this month of intensive and bitterly-fought actions the Fifth Air Force lost six Sabres and three Thunderjets, but its Sabres destroyed a new monthly high of 63 MIG's.<sup>84</sup>

After September 1952 the Communists again returned to more cautious schedules of air combat marked by sporadic engagements with the Sabres. Even the experienced "honcho" pilots were not markedly aggressive unless they had odds heavily in their favor, and the neophyte pilots flew high, in relatively large formations, and when necessary scurried for protection at the Yalu. In October the Reds demonstrated continued ability to elude the Sabre screens, and three times MIG pilots penetrated all the way to Wonsan where they shot down three conventional Navy aircraft.<sup>85</sup> In the latter part of November, when UNC fighter-bombers attacked targets north of the Chongchon on three successive days, MIG's broke through on the third day to effect major damage on three F-84's.<sup>86</sup> Earlier in the summer the Sabre tacticians had concerned themselves with devising an answer to MIG evasion of their screens. After the MIG's got to Wonsan three times in October, a subsidiary daylight barrier patrol was established along the Chongchon River and was flown by four Sabres or Meteor-8's.<sup>87</sup> When the enemy had some success in luring off Sabres with high flights and then getting a follow-up strike through to the fighter-bombers at lower altitudes, the Sabres instituted both high and low patrols. The newly arrived F-86F's were especially worthwhile in this effort for they were generally kept at altitudes above 40,000 feet while the F-86E's operated at altitudes in the vicinity of 30,000 feet.<sup>88</sup> Beginning in November 1952 the high- and low-level patrols were augmented by other flights of Sabres which were posted to certain areas where they were readily available for controlled interceptions of such MIG's as might elude the main screens. After February 1953, when the MIG's began to cause scrambles by penetrating south of the Chongchon in the time intervals between regular



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Sabre patrols, the Fifth Air Force added a flight of four F-86's which flew airborne alerts north of Cho-do Island between the schedules of the main screening patrols.<sup>89</sup>

During the winter of 1952-1953, Communist pilots displayed a wide variation of aggressiveness and ability. The majority of MIG's observed flew high and were evidently engaged in training, but those Red pilots who were willing to fight often displayed good coordination and skillful handling of their aircraft. Early in 1953, observations of camouflage patterns and aircraft markings indicated that the enemy was probably keeping some selected air units in combat. The 4th Wing, for example, reported encounters with a unit of "copper-colored" MIG's that flew as a unit, maintained excellent flight integrity, and demonstrated aggressiveness, tenacity, and skill.<sup>90</sup> During February, March, and April 1953, the 51st Wing commented on a noticeable absence of Red Chinese insignias upon the enemy planes it engaged. These anonymous MIG pilots who committed themselves to combat put up terrific struggles, many times hanging onto the attack or prolonging evasive actions when they could have easily crossed the Yalu. Where MIG's had formerly climbed to evade, these pilots, many of them flying aircraft marked by plain red stars, used almost every maneuver in the book: spins, split "S's," or combinations of swaying back and forth or up and down which made it extremely difficult for a pursuing Sabre to get in a shot.<sup>91</sup> As a general rule, however, Communist pilots after September 1952 were reluctant to attack unless the odds were decidedly in their favor, and they usually singled out small Sabre formations upon which they could work coordinated attacks with superior numbers. One favorite Red tactic was to initiate an attack with a 4-MIG flight, and, when the Sabre flight broke defensively, the first MIG flight would break off and a second Red flight would strike from the opposite side. These changes in the tactical employment of the MIG's demanded larger Sabre flights, and the 4th Wing began to employ sections of eight aircraft to good advantage.<sup>92</sup> The 51st Wing again used 6-aircraft flights, with the fire power concentrated in the flight leader and the two element leaders and with wingmen serving as watchers.<sup>93</sup> Subsequent to 1 January 1953, both F-86 wings experimented with a "train" type of squadron formation. Each "train" was made up

of six flights of four aircraft each. In this refinement of the jet stream, the flights flew the usual "fluid-four" formation, but they remained in a loose trail formation, each flight following another within supporting distance, usually trailing by about one mile. This formation permitted the Sabre wings to get a maximum number of friendly fighters into contact with enemy formations, while it did not hamper the maneuverability, cruising speed, or offensive flexibility of the individual flight. This "train" formation appreciably reduced the susceptibility of individual Sabre flights to enemy attack.<sup>94</sup>

During January 1953 pilots of the 4th and 51st Wings sighted a total of 2,621 MIG-15's over North Korea, succeeded in engaging a total of 333 of these sighted aircraft, and destroyed 32 of those engaged.<sup>95</sup> After this month, which represented the peak sightings of MIG's during the last year of the war, the number of MIG's sighted each month was less than the month before, and, since the ratio of MIG's sighted to MIG's engaged remained approximately constant, combat kills fell off. The Fifth Air Force's Sabre potential was increasing—the 18th Group began flying Yalu sweeps on 25 February and the 8th Group on 7 April, both groups undertaking this activity while transitioning to F-86 fighter-bomber activities—at the same time that fewer MIG's were available for destruction. The 4th Wing had observed, however, that the rate of MIG kills was not necessarily in any direct relationship to the number of MIG's sighted in a month: what was more important was the degree of aggressiveness of the MIG pilots and their willingness to engage in aerial combat. Although it had asked the question before, the Fifth Air Force psychological warfare division therefore began an intensified campaign early in March 1953 on the theme of "Where is the Communist Air Force?" After Communist troop concentrations were attacked by UNC air strikes, specially prepared leaflets were dropped in the vicinity asking the ground soldiers why they were not being helped by their air forces.\* Radio Seoul hammered the theme in

\*It would appear that the Communist ground soldiers were peculiarly apt targets for such a propaganda theme. As early as October 1951 a POW had reported that the Red Chinese soldiers were making such remarks as: "We have superior air power while we hide in air raid shelters," and: "Our President Mao loves airplanes, not soldiers." (PEC INTSUM #3391, 22 Dec. 1951).

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broadcasts beamed northward.<sup>96</sup> The broadcasts and leaflet drops were continued during April, and on 1 May 1953 General Barcus personally supervised against the Communist radio station at Pyongyang an all-Sabre attack which marked the peak of the Fifth Air Force's psychological warfare program. On this Communist holiday, the 4th and 51st Wing covered the 8th and 18th Wing's F-86 fighter-bombers as the latter planes, proceeding initially as if on the usual Yalu patrols, suddenly made a let down from an initial point, dive-bombed the radio station target and the power lines feeding it, and then swept away at low altitudes. After all bombs had been delivered, the voice of General Barcus, who, unknown to higher command had been flying missions with the 51st Wing during March and April, could be heard delivering a message to the enemy over a frequency known to be monitored by them. The General informed the Communists that the Fifth Air Force would be back to bomb military targets in Pyongyang every time that they broadcast "filthy lies" about it.<sup>97</sup>

Whether the Communist air command was spurred into action by this propaganda campaign or whether it instructed its pilots to take combat more seriously in view of the Red ground attack which was going to start on 10 June cannot be established, but the aggressiveness and perhaps the nationality of MIG pilots who engaged the Sabres changed quite sharply in mid-May 1953. In the first half of May the Red airmen stood down on several days when weather would have permitted them to fly, and on the days when the MIG's were out they were reluctant to engage. During this period of 1-15 May, Sabre pilots observed 608 MIG's, of which 138 or 22.7 percent were encountered in combat. In the last half of May, however, 899 MIG's were observed and 399 or 45 percent of them were encountered by the F-86's. Numerous aircraft with Red Chinese insignia were met, and their pilots revealed that they had "more enthusiasm than know-how." Although these pilots had obviously been instructed to fight, they were generally lacking in skill: unintentional spin-outs were frequent and one reluctant Red ejected from his plane before an engaging Sabre could get within firing range. All of the combat took place north of the Chongchon River, and during the month there were no more than a few scattered MIG flights south of that river. While the total

MIG sightings during May continued the downward monthly trend of MIG sorties, the Sabre pilots, now benefiting both from technical improvements in their aircraft and from the willingness of the MIG pilots to engage in combat, effected an excellent kill-to-loss ratio. In May, 56 MIG's were destroyed, 4 more were probably destroyed, and 27 were damaged. The loss to enemy action was one F-86, and the pilot of this plane was successfully rescued.<sup>98</sup>

In June 1953 the total monthly sightings of MIG aircraft was even less than it had been in May, but during this month the Sabre pilots effected the peak kill of the Korean hostilities. The Red air command probably felt that it was necessary to put out an effort to accompany the Red ground offensive, but during the first half of June the MIG pilots were wary and hesitant to engage in combat. The Sabres observed 637 airborne MIG's but only 184 (29 percent) of them could be engaged in combat. Again the Red pilots were poorly skilled: a mid-air collision between two MIG's chopped the tail off one and the other spun in while attempting to turn tight inside a pursuing F-86; four other MIG's were observed to go into fatal spins, two after they had been hit and two before the Sabres fired on them. During the last half of June the MIG pilots continued to be neither alert nor aggressive, but a combination of circumstances permitted the Sabres to engage 317 (50.2 percent) of 631 MIG's observed. In the period there was an incidence of heavy, multi-layered clouds and the Communist pilots apparently attempted to sneak under the weather, thus evading the Sabre barrier patrols. Whatever the Communist reasoning may have been, the air combat during the last half of June was characterized by an unusually high proportion of encounters below 40,000 feet. For once, higher flying Sabres were able to initiate 70 of the 92 engagements with the enemy planes, and during June 1953 the Sabres made their peak monthly kill of the Korean hostilities: 77 MIG's destroyed, 11 probably destroyed, and 41 damaged. On 30 June, the Sabres destroyed 16 MIG's for a new day's record which exceeded the previous highs of 13 kills scored on 4 July and 4 September 1952. During the month there were only 17 MIG sightings south of the Chongchon, of which 16 were noted on 30 June when a formation of MIG's was caught heading northward from Pyongyang, probably intending

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to ambush Sabres who were returning home low on fuel. During the June combat actions the Sabre wings lost no F-86's to the enemy, and only one F-86 received major damage in combat with Red aircraft.<sup>99</sup>

Although the Communists were reckless with their ground troops in the line and continued useless ground attacks in July 1953, they played it safe with their airplanes in "MIG Alley" during this last month of the Korean hostilities. The Sabres got only 32 MIG kills in July, which, while

good for the period of hostilities, represented a let down from the remarkable victory of June 1953. On the last day of the war, 27 July, 369 Sabre sorties saw only 12 MIG's, all headed for home in Manchuria. At twilight on this day, however, Capt. Ralph S. Parr, 4th Wing, met and shot down an unwary IL-12 transport which had apparently wandered off course and had crossed south of the Yalu near Manpojin. Captain Parr thus achieved the distinction of destroying the last enemy aircraft in the Korean war.<sup>100</sup>

### COUNTING THE COMBAT SCORE

**Records of Red Aircraft Destroyed:** During the Korean hostilities pilots of FEAF units, the 1st Marine Air Wing squadrons, the 77th RAAF Squadron, and the 2d SAAF Squadron claimed to have destroyed a total of 976 Communist aircraft. Some 953 of these Red aircraft destroyed were claimed by USAF pilots, 900 of them in the air and 53 of them on the ground. These USAF claims are detailed in figure 8.

While nearly all types of UNC aircraft at some time destroyed Red aircraft, the air superiority battle for Korea was characterized by air-to-air combat between American F-86 Sabrejets and Communist MIG-15 jet interceptors. That air superiority was maintained was demonstrated by the combat destruction records of the Sabres, which, in the course of the war, destroyed 792 MIG-15 fighters in aerial combat and lost only 78 of their own number to enemy air action.<sup>101</sup> The Fifth Air Force Sabre wings so adequately discharged their mission that General Barcus could state that the UNC possessed "unquestioned air supremacy over the North Korean homeland between the main line of resistance and the Chongchon River, and complete air superiority between the Chongchon and Yalu Rivers."<sup>102</sup> The extent of this air superiority was evidenced by negligible losses and damages to UNC fighter-bombers and other such vulnerable aircraft from MIG attacks.

The extent of the UNC air superiority was also demonstrated in the 10 to 1 combat victory which the F-86's achieved over the Red MIG-15's. As was the case with any facet of the Korean operations, however, this 10 to 1 margin of Sabre victory had to be viewed with recognition of the fact that the UNC was never allowed to make all-out attacks against the Communist air forces and that

Sabre employment was primarily defensive. It must also be equated with an understanding of the fact that the Reds did not utilize their full potential to contest the UNC control of the air over North Korea.<sup>103</sup> But the Sabre victory was nonetheless significant and must have been persuasive to the Communist bloc nations: as succinctly phrased by Col. John W. Mitchell, "the ability of our pilots to take the MIG . . . has undoubtedly slowed the Russian in his headstrong rush into another war. It has made him consider the fact that he is not quite ready yet, and it must rankle him to know that we are getting better and stronger all the time."<sup>104</sup>

**Sabre Pilots and the Air Victory:** "The Fifth Air Force," said General Anderson, "maintained air supremacy through an adequate combination of the technical capabilities of its fighter aircraft with superior individual pilot proficiency, flight integrity, and air tactics."<sup>105</sup> Although technical improvements in the Sabre aircraft helped, the 10 to 1 Sabre victory was due, more than to any other single factor, to the well-trained, experienced, and aggressive F-86 pilots who utilized the tactics best calculated to exploit the capabilities of the planes they flew.

Situational conditions over northwestern Korea, the fantastic speeds of jet air combat, and visual limitations in the great grey realm of high altitudes demanded more skill and judgment from Sabre pilots than previously known in air-to-air fighting. In fighter versus fighter combat, advantage lies with the pilot who maintains a superior altitude since he has opportunity to engage or break off at will. "Knowing that the MIG-15 has a higher service ceiling than the F-86," stated the 4th Wing Ace, Capt. Manuel J. Fernandez,

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USAF CLAIMS OF ENEMY AIRCRAFT BY TYPE AIRCRAFT

26 June 1950—27 July 1953

Type claim and type enemy aircraft	Grand total	Air-to-air by type model USAF aircraft										Total air-to-ground
		Total	B-26	B-29	F-51	F-80	F-82	F-84	F-86	F-04	RB-29	
Destroyed—All type	953	900	7	18	10	37	4	9	810	4	1	53
TU-2	9	9							9			
YAK-3, 9, 11	40	24	3		3	10	2	1	5			16
LA-5, 7, 9	6	6			1	1			3	1		
IL-2, 10	5	5			5							
MIG-15	827	823		16		6		8	792	1		4
IL-12	1	1							1			
PO-2	5	5	4							1		
U/I Fighter	59	26		2	1	20	2				1	33
U/I Aircraft	1	1								1		
Probable—All type	193	168		11	3	21	2	12	118	1		25
TU-2	1	1			1							
YAK-3, 9, 11	16	7			1	6						9
LA-5, 7, 9												
IL-2, 10	1	1			1							
MIG-15	148	145		7		8		11	118	1		3
IL-12												
PO-2												
U/I Fighter	27	14		4		7	2	1				13
U/I Aircraft												
Damaged—All type	1,009	973	7	15	12	41		82	814	2		36
TU-2	4	4							4			
YAK-3, 9, 11	33	15	3	3	1	8						18
LA-5, 7, 9	8	4	1						2	1		4
IL-2, 10	3	3			2	1						
MIG-15	951	946	3	11	9	32		82	808	1		5
IL-12												
PO-2												
U/I Fighter	9											9
U/I Aircraft	1	1		1								

Source: USAF Statistical Digest, FY-1953, p. 52.

Figure 8.

Jr., "we must compensate for our deficiencies by outsmarting the enemy and forcing him to make a mistake once contact has been initiated."<sup>106</sup> In "MIG Alley" the enemy had so many advantages of altitude, air speed, and position that he could almost always be expected to initiate combat on the terms most favorable to himself: the work of the Sabre pilot was to neutralize this momentary tactical advantage which the enemy had gained and then, within the few seconds permitting, initiate his own attack. Fortunately, the USAF possessed men with the skill and the courage to win under such unfavorable combat situations.

The background of the Sabre pilots who fought in Korea was generally high even by USAF stand-

ards and very high when related to the probable proficiency of the average fighter pilot who would be available in any large-scale war. Viewed as a body, the Sabre pilots fell into three general categories of experience. When it came to the Far East, the 4th Fighter-Interceptor Wing was manned by highly qualified professional and reservist career officers, most of whom had been fighter pilots in World War II and not a few of whom were already conventional Aces. In the late summer of 1951 many of these pilots were rotated either as 100-mission veterans or as Aces,\*

\*On 1 June 1951, USAF stated the policy that jet fighter pilots who destroyed five or more hostile jet aircraft in air combat would be returned to the United States, but when many of

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but similarly experienced fighter pilots would continue to fill the key slots as element and flight leaders. Most of these experienced fighter pilots were "old men" by usual standards for fighter pilots, but jet combat experience in Korea early demonstrated that the age of a pilot was much less important than his mental outlook and that the strain of jet air combat on a man's physical constitution was actually less than that encountered in conventional fighters during World War II. A FEAF statistical study made in March 1953 further demonstrated that the majority of MIG kills went to experienced pilots: some 68 percent of pilots who destroyed MIG's were over 28 years old, whereas 67 percent of pilots who scored no kills were less than 25 years of age. Pilots with MIG kills to their credit in Korea had flown an average of 18 missions in World War II, while pilots with no kills had flown an average of 4 missions in World War II. It appeared clear from this study that the more actual combat experience a pilot had, the better were his chances of destroying enemy aircraft.<sup>107</sup>

"Age as measured in years," reported the 4th Group, "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 provided he started out in fighters."<sup>108</sup> While the 4th Group experience demonstrated that an "old" fighter pilot had advantages in jet air combat, such was by no means true of other experienced pilots who had not had their combat time in fighters. In the winter of 1951-1952 the Korean Sabre wings received a large number of reservist and regular pilots whose combat experience had been in multi-engine transports or bombers. The personnel action lying behind the assignment of such people was a serious shortage of F-86 replacements following the conversion of the 51st Wing to Sabres,<sup>109</sup> but the 4th Group stated: "We feel that it is an almost impossible task to take a pilot who flew transports or heavy bombers in World War II, who got out of the service and grew old mentally and fat physically for several years, recall that pilot, and expect him to fly a quick course in F-80's and become a replacement

them desired to remain in combat the policy was amended to allow commander FEAF to return or retain jet Aces who volunteered to remain in the theater. (Staff Hist., DC/S Pers. USAF, July-Dec. 1951, p. 14.)

pilot for F-86 flying." The group completely endorsed the old Air Force custom whereby pilots were typed for flying fighters or multi-engine aircraft at the end of cadet training: this had been a sound practice which had become even more valid with the high degree of modern aircraft specialization. "We feel," stated the Group, "that it is a waste of the government's time and money to take a 30- to 32-year-old man whose service has been in troop transport or multi-engine flying and attempt to train that man to engage in the highest form of aerial combat that has ever been developed. There are very few individuals who can do it, but they are rare and unusual."<sup>110</sup>

Utilization of the third category of Sabre replacement pilots—young jet fighter pilots fresh from flying training schools—received in ever increasing proportions after early 1952\* presented problems but gave less difficulty than the conversion of older multi-engine pilots: "As long as we continue to receive qualified jet pilots," reported one Sabre squadron, "the training program will not be impossible, merely difficult."<sup>111</sup> A few of these young pilots were precocious: Lt. James F. Low became the 17th jet Ace on 15 June 1952 when just six months out of flying school and after only six weeks in combat.<sup>112</sup> But these newly graduated pilots arrived in such numbers in the winter of 1952 and the spring of 1953 as to overwhelm the training flights of both Korean fighter-interceptor wings. Since a pilot in active Sabre combat had to have at least 15 combat missions a month to maintain his peak proficiency, there was no solution to the excess of pilots but to maintain a backlog in training flights, often in varying degrees of idleness. Because of this backlog the young pilots were cleared for combat flying not when they were proficient but when slots were available through rotation of other pilots. The Sabre wings realized that "idle pilots, like idle aircraft, tend to develop eccentricities and small faults,"<sup>113</sup> but there was no better local solution to the problem of an excessive flow of fighter pilot replacements which was common in all Fifth Air Force fighter wings in late 1952 and early 1953.

As waged over northwestern Korea, aerial combat between the men who flew the Sabres and the Reds who piloted the MIG's was quite properly called "the highest form of aerial combat that

\*See Chap. V, pp. 162-63.

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has been developed." To see the enemy first was vital, and the development of such a degree of alertness required hard work and constant practice. Jet aerial combat above 40,000 feet required precision flying ability derived from a thorough knowledge of aircraft characteristics, both of friendly and hostile planes. To profit from an enemy's mistakes in the few seconds allowed, successful Sabre pilots had to possess an ability to shoot accurately. Team spirit was of utmost importance, and the individualist was of no value and an actual hazard to his comrades in combat.<sup>114</sup>

Perhaps the greatest requirement of jet air combat, however, was a pilot's driving will to succeed—an "Every Man a Tiger" aggressiveness—because victory in jet air battle could be scored only by an aggressive pilot. Whether in setting up an attack against the agile MIG's, or in evading an initial MIG pass and then counterattacking, the advantage in high-speed jet combat lay with the aggressive pilot. "Many jets," stated 4th Group doctrine, "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 and only half as skillful."<sup>115</sup> One of many incidents illustrating the worth of an aggressive spirit occurred on 18 February 1953 just south of the Sui-ho reservoir when 4 F-86's attacked a formation of 48 MIG's, shooting down 2 of the enemy planes and causing 2 others to spin-out and crash when they attempted to follow the Sabres through violent evasive maneuvers.<sup>116</sup>

There were a few peak periods of action in the counterair war over "MIG Alley" when the Red airmen were obviously instructed to fight viciously, but on each occasion the Reds lost heavily and soon went timid. Such months of peak MIG destruction were April 1952 with 45, September 1952 with 63, May 1953 with 56, and June 1953 with 78 MIG kills. The bulk of Sabre victories, however, was rolled up at a rate of not more than a few on any one day. Benefiting from periods when the MIG pilots demonstrated a willingness to engage in combat but accumulating other scores in more usual day-to-day patrolling actions, a total of 39 Fifth Air Force pilots downed 5 or more hostile jet aircraft to enroll themselves among Air Force immortals as jet air aces. This Honor Roll of Jet

FIFTH AIR FORCE JET FIGHTER ACES

1. Maj. James Jabara.....	20 May 1951
2. Capt. Richard S. Becker.....	9 Sep 1951
3. Capt. Ralph D. Gibson.....	9 Sep 1951
4. Lt. Col. Richard D. Creighton.....	27 Nov 1951
5. Maj. George A. Davis, Jr.....	30 Nov 1951
6. Lt. Col. Winton W. Marshall.....	1 Dec 1951
7. Maj. William T. Whisner, Jr.....	23 Feb 1952
8. Col. Francis S. Gabreski.....	1 Apr 1952
9. Capt. Robert H. Moore.....	5 Apr 1952
10. Capt. Iven C. Kincheloe.....	6 Apr 1952
11. Capt. Robert J. Love.....	21 Apr 1952
12. Maj. William H. Wescott.....	26 Apr 1952
13. Capt. Robert T. Latshaw, Jr.....	3 May 1952
14. Maj. Donald E. Adams.....	3 May 1952
15. 1st Lt. James H. Kasler.....	14 May 1952
16. Col. Harrison R. Thyng.....	20 May 1952
17. 2d Lt. James F. Low.....	15 Jun 1952
18. Capt. Clifford D. Jolley.....	8 Aug 1952
19. Maj. Frederick C. Blesse.....	4 Sep 1952
20. Capt. Robinson Risner.....	21 Sep 1952
21. Col. Royal N. Baker.....	17 Nov 1952
22. Capt. Leonard W. Lilley.....	17 Nov 1952
23. Capt. Cecil G. Foster.....	22 Nov 1952
24. Capt. Dolphin Overton III.....	24 Jan 1953
25. 1st Lt. Harold E. Fischer, Jr.....	24 Jan 1953
26. Capt. Manuel J. Fernandez, Jr.....	18 Feb 1953
27. Capt. Joseph McConnell, Jr.....	9 Mar 1953
28. Maj. James P. Hagerstrom.....	27 Mar 1953
29. Col. James K. Johnson.....	28 Mar 1953
30. Lt. Col. George L. Jones.....	29 Mar 1953
31. Lt. Col. George I. Ruddell.....	23 May 1953
32. Lt. Col. Vermont Garrison.....	5 Jun 1953
33. Capt. Lonnie R. Moore.....	18 Jun 1953
34. Capt. Ralph S. Parr.....	18 Jun 1953
35. Col. Robert P. Baldwin.....	22 Jun 1953
36. 1st Lt. Henry Buttelmann.....	30 Jun 1953
37. Maj. John F. Bolt (USMC).....	11 Jul 1953
38. Capt. Clyde A. Curtin.....	19 Jul 1953
39. Maj. Stephen L. Bettinger.....	20 Jul 1953

Figure 9.

Aces is recorded in figure 9. Of these Aces, the 4th Fighter-Interceptor Wing produced 24, the 51st Fighter-Interceptor Wing had 14, and the 18th Fighter-Bomber Wing had one (Maj. James P. Hagerstrom) during its transitional period to fighter-bomber work. The first jet air Ace was Maj. James Jabara, who was promptly removed from combat under the initial policy of mandatory rotation for jet Aces but was later allowed to volunteer for a second Korean tour, during which he became a triple jet Ace. High scorer in the Korean conflict was Capt. Joseph McConnell, Jr., the first triple jet Ace and ultimate destroyer of 16 MIG's. Third ranking Ace was Capt. Manuel J. Fernandez, Jr., with credit for the destruction

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of 14½ MIG's.<sup>117</sup> To these men who became jet aces, to the many other pilots who scored lesser numbers of kills, and to the many more wingmen who scanned the skies, covered their leaders, and seldom got good shots must go the credit both for the 10 to 1 Sabre victory in Korea and for the maintenance of UNC control of the air over North Korea.

**A Note on Project MOOLAH:** On the night of 26/27 April 1953 two medium bombers dropped approximately 1,200,000 leaflets over enemy air bases and other selected targets deep in North Korea. These leaflets offered in Russian, Chinese, and Korean language texts a monetary reward to any Communist pilot who would deliver a MIG-15 or other Soviet-made jet plane to the UNC forces in Korea. The first enemy pilot who took advantage of the offer was promised an additional \$50,000 bonus, but all comers were to receive \$50,000, political asylum, resettlement in a non-Communist country, and anonymity if desired. Escapee pilots were instructed to fly to Paengnyong-do (island), to proceed thence at 20,000 feet altitude to Kimpo (K-14), and to make an immediate landing at this field. On 27 April, FEC radio transmitters began to broadcast the same offers and instructions in Russian, Chinese, and Korean. So was initiated project MOOLAH, a plan from which the USAF hoped to get a flyable Red jet for testing and through which CINCFE expected to promote mutual suspicion among enemy pilots.<sup>118</sup>

According to General Clark's memoirs, project MOOLAH had first been conceived early in 1952 by war correspondents in Seoul as they communed with a bottle of brandy and speculated on the possible effect of "silver bullets" upon the Chinese Communists.<sup>119</sup> Another report had it that MOOLAH was born in discussions by a group of social scientists at the Harvard University Russian Research Center.<sup>120</sup> Whatever its genesis, the project was discussed in Washington, was approved and cleared by the JCS on 20 March 1953, and was transmitted to CINCFE in final form by the U. S. Joint Psychological Committee on 1 April 1953. On 13 April, CINCFE made AFFE the coordinating authority for the project, which was to be initiated about 15 April, the exact date to be agreeable to AFFE and FEAF.<sup>121</sup> The Fifth Air Force on 21 April issued the necessary instructions providing for the reception of such

Communist aircraft and airmen as defected.<sup>122</sup> And finally, on 27 April MOOLAH was implemented, the date being set to coincide with the resumption of armistice negotiations: General Clark selected that particular date in order to give the Communists some "extracurricular worries" at the same time at which he was having troubles with Syngman Rhee.<sup>123</sup> Following the initial leaflet drops, two more drops were made: 90,000 leaflets upon two enemy airfields near the Yalu on the night of 10 May and 400,000 leaflets in the same area on the night of 18 May.<sup>124</sup>

The results of MOOLAH were difficult to assess. One journalist whose article extolled the Harvard Russian Research Center stated that: "It proved astonishingly effective. As a direct result, all MIGs were promptly grounded for eight days. Even when they started flying again, the effectiveness of the Red Air Force had been seriously impaired."<sup>125</sup> General Clark wrote that: "The Reds' first reaction to it was to ground all MIG's for eight days. It might have been because of the weather, or because they wanted time to screen out the politically unreliable pilots. Most likely it was the latter." General Clark also thought it significant that "the Communist MIG pilots who were permitted to fly after the offer was made were the worst—on their record—of the whole Korean war."<sup>126</sup>

Closer analysis of the record fails to substantiate the claim that following the implementation of MOOLAH "all MIGs were promptly grounded for eight days." On 28 and 29 April adverse weather kept the MIG's and most Sabres grounded, but on 30 April an estimated 166 MIG's were sighted and the Sabres shot three of them down. Activities of the MIG force were slack on the first three days of May when the weather was completely operational: 30 MIG's were sighted on 1 May, 44 on 2 May, and none appeared on 3 May. Thereafter through 7 May the weather was marginal to nonoperational, and, although hostile flights were tracked by radar, no enemy aircraft were sighted. While there were no engagements between Sabres and MIG's during the first seven days of May, there was no substantiation for such a sweeping claim as that all MIG's were grounded.<sup>127</sup>

There was some circumstantial evidence that the USSR feared the MOOLAH offer more than did the Chinese and North Koreans. An unlocated

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radio transmitter began jamming Russian language broadcasts of the reward for defector pilot but did not interfere with Korean or Chinese language versions. Possibly pertinent was a Soviet news broadcast which noted that Soviet Far Eastern audiences were being shown a film depicting the failure of U. S. intelligence agents to bribe the crew and passengers of a Czech plane into defecting to the west. On 27 May, moreover, an unusual message from Korean Communist leader Kim Il Sung to the "heroes" of the NKAF promised that this air force would have a greater responsibility for air defense than theretofore and exhorted Korean airmen to strengthen their military discipline and protect their equipment.<sup>128</sup> Presumably the Russians may have well believed that the UNC reward offer would appeal to their satellite airmen: the leaflets, for example, carried the picture of Lt. Franciszek Jarewski who had flown his MIG-15 from Poland to political asylum in

Denmark in March 1953. It is possible that in early May the Russians may have withdrawn their own and their European satellite pilots from the Korean conflict: during this month, as has been seen,\* the Sabre pilots speculated that there had been some change in the nationality of MIG pilots. As for getting the MIG-15 aircraft which USAF desired for tests, MOOLAH was quite unsuccessful. On 21 September 1953, North Korean Lt. Ro Kum Suk did bring a MIG-15 aircraft to Kimpo, but Lt. Ro's defection was due to his disgust with the Communist regime and he claimed never to have heard of the \$100,000 windfall which he was to receive.<sup>129</sup> The final FEAF statement on MOOLAH was: "No positive information has been made available to substantiate the conclusion that the announcement of the \$100,000 offer was responsible for any variation in Communist air activity."<sup>130</sup>

#### IMPROVING THE PERFORMANCE OF THE SABRE

**Gunnery Problems:** In Korea almost all air-to-air fighter versus fighter kills were made from fairly close range and from dead astern. Although necessary because of aircraft performance and the geographical situation, Sabre pilots recognized a number of disadvantages to the stern attack: a tail chase, even when the Sabre possessed an initial speed advantage, normally covered so much ground that the MIG could be expected to escape across the Yalu; moreover, if either a MIG or a Sabre pilot prolonged a tail chase, he could expect a coordinated hostile attack on his own rear. The MIG's structure was also such that it was least vulnerable to attacks from this quarter: in this attitude the MIG presented its smallest area, its engine protected the main fuel cells, and both engine and armor plate protected the pilot. For this reason the estimate was that from the rear only 6 or 10 percent of hits scored on a MIG could result in kills.

Sabre Aces agreed that the most desirable spots to gun a MIG were in the cockpit or just behind it and into the engine and fuel tanks, but the best of them found such deflection shots next to impossible in the usual combat situation. With the existing Sabre equipment the best attacking attitude was therefore from astern and up the MIG's tail-pipe: at close enough range such an attack would nearly

always badly damage the MIG and might slow it up enough so that better aimed bursts could shoot it down. The MIG, moreover, had a "U" shaped auxiliary fuel tank wrapped around its tailpipe. Because this tank apparently had no self-sealing or purging feature the enemy pilot probably was expected to exhaust it first, but if a Sabre's burst found fuel in this tank there was an excellent possibility of a stern kill. These rearward attacks nearly always damaged and frequently destroyed MIG's, but they increased the longevity expectations of the MIG pilots: the Fifth Air Force estimated, for example, that at least two-thirds, and probably more, of the MIG pilots shot down in Korean combat successfully escaped their aircraft and returned to fly again.<sup>131</sup>

**Project GUN-VAL:** Quite early in their stint of duty in Korea, Sabre pilots reported and gun camera film verified that they were getting a large number of hits on MIG's without destroying or slowing these planes. The Sabre pilots found that their six M-3 .50-caliber guns were effective at ranges within 1,000 feet but not so effective in the typical stern chases where they could get no closer than from 1,500 to 2,500 feet. Most pilots believed that heavier armament would have en-

\*See p. 57.

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abled them to have destroyed a number of MIG's at ranges up to 2,500 feet, which had otherwise been claimed as "damaged" or "probables." What 4th Wing pilots wanted was a six 20-mm. cannon battery with the high cyclic rate and dependability of their old machine guns. Already cognizant that fuel-purging systems and the fleeting opportunities of jet combat demanded harder-hitting aerial weapons, the USAF had in design more destructive weapons. Under development were two revolver-type guns based on German experimental designs: the T-130, a 15-mm. gun, and the T-160, the same gun in a 20-mm. size. The objective of this developmental program was a high rate of fire weapon which could use 15-mm., 20-mm., or 27-mm. ammunition merely by interchanging barrels and ammunition drums.<sup>132</sup>

Delivery of production versions of the T-130 and T-160 guns began in October 1952, and an Air Proving Ground Command (APGC) project called GUN-VAL was promptly established to test the 20-mm. gun in combat. Eight GUN-VAL F-86F's, each equipped with four T-160 guns, were received by the 4th Wing in January 1953.<sup>133</sup> Twelve combat sorties were flown and three MIG's fired on at extreme ranges without apparent damage before 25 January, when one of the GUN-VAL pilots, returning from a "MIG Alley" test, cleared his guns at 37,000 feet over the Yellow Sea. This pilot experienced an immediate engine compressor stall and was unable to restart but successfully ejected and was rescued from the water.<sup>134</sup> The diagnosis was that blast gases resulting from simultaneous firing of all four guns at high altitude had caused a compressor stall, and wiring circuits in a local fix were changed to permit selective firing of two guns above 35,000 feet and four guns below this altitude.

Investigators at Wright Field determined that about four times as much gas was emitted from the muzzles of four T-160's as from six M-3 machine guns, and power plant technicians conceded that a sizeable puff of burning gas could enter the air intake of a jet fighter and snuff out its engine. While the Fifth Air Force experienced three of these compressor stalls when the four-gun battery was fired at high altitude, a variety of field test agencies in the United States at first failed to reproduce the burning gas effect. Using special ammunition, the North American Company in March 1953 finally was able to reproduce these

stalls, and it then devised blast deflectors which in tests dissipated the gun gases. Such blast deflector kits were sent to Korea, but there they failed to accomplish their purpose, perhaps because of some peculiarity of atmospheric conditions. Until the gun gas phenomena was exhaustively tested and better understood, further developmental work was effectively halted.<sup>135</sup>

In Korea, however, results of GUN-VAL were not entirely disheartening. Using limited fire the T-160 equipped F-86F's in the period February through April 1953 flew a total of 284 combat sorties, sighted 139 MIG's, and fired on 41 of these. Of 22 MIG's seen to be hit, 6 were destroyed, 3 more probably destroyed, and 13 damaged. If the GUN-VAL aircraft had been able to use all four guns there was a good probability that there would have been more kills. No GUN-VAL aircraft were destroyed by enemy action, although one was lost because of the gun gas induced stall and another to engine failure not related to this problem. The T-160 guns demonstrated a capability to fire consistently at a rate of 1,500 rounds per minute with a stoppage rate in 108,893 rounds fired of only 2.2 per thousand rounds. The Korean phase of GUN-VAL was ended on 1 May 1953, at which time the remaining aircraft in the project were returned to the United States for further testing.<sup>136</sup>

**Gun-Bomb-Rocket Sighting Systems:** Few problems in the Fifth Air Force were more vexing and longer lived than those involving the electronic sighting systems used in late model Thunderjets and Sabres. The F-86A's first arrived in Korea with K-18 sights, but these sights received adverse reports and were replaced on production model F-86E's with a newly developed J-1 fire control system. This system, also installed in later model F-84 aircraft, comprised the A-1C gun-bomb-rocket (GBR) sight, the AN/APG-30 radar, a range servo, and a power pack. The USAF Air Materiel Command later conceded that the decision to produce the A-1C sight had been a little premature, considering its state of development. Too few trained maintenance people were available in the theater, and supply support and test equipment were inadequately provisioned.<sup>137</sup>

Although the A-1C sight differed radically from the gunsights it superseded, spare parts, spare components, and test equipment did not reach the Far East until at least six months after

the sight was first put into use in mid-1951.<sup>138</sup> In the meanwhile, the sighting system was beset by a multitude of maintenance problems, some due undoubtedly to rough Korean runways which jarred delicate electronics components, but most of them developed from a dearth of trained personnel, necessary equipment and supplies, and a general lack of pilot training in the use of the system. Sabre pilots soon came to have little faith in the sight's functioning, and as a result many of them favored the clearly inferior but dependable K-18 sight, while others caged the A-1C sight to eliminate radar and gyro-inputs and get fixed sight characteristics. Considerable reliance was also put in tracer ammunition, which allowed several MIG kills to be made when sighting systems failed; this tracer ammunition also made jittery MIG pilots break and permitted the pursuing Sabre to close.<sup>139</sup> The F-84 fighter-bomber pilots similarly used the A-1C sight in make-shift fashion: for dive-bombing one wing used the rocket setting with the sight caged, the other wing used the bombing function as intended but released manually, and neither F-84 wing successfully used the automatic bomb function.<sup>140</sup> In February 1952 the Fifth Air Force director of operations had witnessed so much trouble with the A-1C sight that he informed a staff conference that it was "too complicated to be maintained."<sup>141</sup>

General Weyland was nevertheless convinced that the A-1C sight and its associated equipment had not received an adequate test in combat, and at his request the Air Materiel Command instituted all-out remedial action. Having diagnosed the problem as one of inadequate provisioning and insufficient technical training, the AMC and the Air Training Command cooperated in a project called JAYBIRD, which sent technicians to Korea both to renovate the sighting systems and to train the wing sight specialists needed to maintain them. At the suggestion of this team various local remedial actions were also taken: one which proved very practical was to consolidate squadron sight maintenance sections into one fighter wing sight shop, allowing maximum use of scarce personnel and equipment.<sup>142</sup> By the end of June 1952 project JAYBIRD had almost completed its work and sighting system problems were much improved. Factors which contributed to JAYBIRD's success were a high USAF precedence and supply priority which permitted adequate supplies

of test equipment, spare parts, and components and the utilization of topflight technical representatives. In addition, JAYBIRD provided an emergency solution to the perplexing problem of systems responsibility: the J-1 fire control system comprised components manufactured by at least five contractors, no one manufacturer having had complete systems responsibility. The USAF project officer with JAYBIRD assumed such a responsibility with complete success.<sup>143</sup>

Hardly had the problems of the J-1 fire control system been brought under improved control, however, than production model F-84G's and F-86F's began to arrive in the Far East with an improved MA-3 system, incorporating a new A-4 GBR sight. These planes arrived in August through October 1952 without prior notification that the sighting system had been changed, and they were unaccompanied by necessary test equipment.<sup>144</sup> Once again there was a lag, this time of four months, before adequate spare components and specialized test equipment were made available in the theater.<sup>145</sup> Meanwhile, frequent radar malfunctions rendered these automatic-computing sights useless except in manual ranging positions. When the sight did work it was very effective, but numerous design difficulties made it so undependable as to raise new pilot doubts as to the value of the equipment.<sup>146</sup> In the Thunderjet wings the automatic dive-bombing function of the A-4 sights proved unsatisfactory, necessitating the use of the rocket function for fixed-sight bombing. The Fifth Air Force now frankly questioned the use of any system where two of its three basic functions were out of order.<sup>147</sup>

Once again the AMC instituted remedial action, and in February 1953 a 15-man team of technicians reached Korea to institute a five-fold project called SIGHTLINE. This project provided a 90-day stock level for the A-4 sight at each K-site, provided each unit with its authorized test equipment and instructed maintenance personnel in its use, replaced D-7 inverters with more rugged D-2 inverters, set up a depot maintenance shop at FEALOGFOR for the repair of sighting systems, and designed and supplied mobile armament systems trailers which could perform the work previously done in improvised radar sight shops. An arrangement was made whereby FEALOGFOR controlled all sight and radar equipment and ran a twice-weekly C-47 courier service to each K-

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site.<sup>148</sup> By October 1953 SIGHTLINE had completed its work and all sight systems had been provided with the latest modifications. The 58th Fighter-Bomber Wing spoke for the success of the project, calling it "outstanding."<sup>149</sup> Shortly after SIGHTLINE had gotten to work, discontent with the A-1C and A-4 gunsights and the APG-30 ranging radar materially diminished. Greater experience with the systems, improved supply and maintenance, and better training provided the answers to the sighting system problems.<sup>150</sup>

Improvements to the mechanics and electronics of the fire control systems were made by both JAYBIRD and SIGHTLINE, better suiting them to their specialized purpose in Korea. The A-1 and A-4 sights, for example, had been designed to compute leads at ranges up to 1,500 yards. While this feature was desirable against slow-moving bomber targets, it introduced over-sensitivity when the sight was used against a violently maneuvering MIG at the closer ranges demanded by the M-3 machine guns. A "Jenkins Limiter" which was worked out at the Air Proving Ground reduced the sensitivity of the sight at long ranges and provided visual indications to the Sabre pilot when he was within a preselected maximum shooting range.<sup>151</sup>

Preparatory to the utilization of the F-86F as a fighter-bomber, the A-4 sight was especially modified for this work by the addition of a manual pip control (MPC), consisting of a bombing altimeter and a dive-angle indicator. Activated by an off-on toggle switch, the MPC when "on" provided a control which would electrically depress the A-4 sight reticle through a range of 0 to 170 miles.<sup>152</sup> Under the combat conditions in Korea the MPC was unsatisfactory, "primarily because it is not tactically sound to depend on pre-planned entry altitudes and air-speeds for the dive bomb run." Use of the automatic bombing function of the A-4 sight was similarly unsatisfactory, with the result that F-86F fighter-bombers continued to use the rocket function for the most satisfactory dive bombing. The final Fifth Air Force report on the F-86F fighter-bomber noted that the terminal velocity of this aircraft was usually constant in a dive-bombing run and release altitudes could be instinctively determined through practice: the recommendation was therefore made that the A-4 bomb function should be deleted, the gunnery and rocket functions retained, and a gyro-controlled

automatic sight depression system added to the sight for varying dive angles in bombing runs.<sup>153</sup>

The many troubles incident to the use of the A-1 and A-4 GBR sights led to serious questioning as to whether they should be retained on USAF fighters, or whether such systems were merely 200-pound "luxury gadgets" which represented superfluous weight. In the summer of 1952 some 14 Korean Aces, who had fought the MIG when the A-1 sights were performing at their worst, vigorously recommended to General Vandenberg that the A-1 sight be replaced with a manual ranging, gyro-computing sight similar to the K-14 or K-18. On 8 September 1952, General Vandenberg therefore directed both the APGC and FEAFF to evaluate the sight problem. An APGC test soon concluded that the kill probability with the A-4 sight with radar ranging was twice that attainable with the A-1 or K-14 sights with manual ranging. The APGC recommended that efforts be made to improve the reliability of the sighting systems, especially the functioning of the APG-30 radar. A seminar of current Fifth Air Force Aces, held on 11 September 1952, agreed that the automatic features of the A-1 gunsight should be retained. In Korea they recognized that most MIG kills were obtained from low deflection shots, but all of the pilots attributed this to the short-range guns of the Sabre. With improved armament, they predicted that deflection shots would become more usual. It was true, they said, that superior pilots with a number of years of experience would probably do well with a Mark 18 sight, but in any future conflict they foresaw that the burden of air combat would fall upon younger pilots who would have neither the experience nor the training which would make them superior gunners. The Sabre Aces believed that sighting system problems could be resolved by a redesign to include fast change components, judicious assignment of competent technicians, and an accelerated training program both for the technicians who would maintain and the pilots who would use the automatic sighting systems.<sup>154</sup>

**Performance Problems:** During most of 1951 it seemed to Sabre combat veterans that the USAF was giving far too much attention to armament problems and was failing to come to grips with the fact that under the conditions of the Korean air-to-air war the MIG-15 could simply outperform the F-86A and F-86E aircraft then in use. "Almost

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all the experts except those who actually fought here," observed a 4th Fighter-Interceptor Group study, "looked at everything but the thrust coming out of the tailpipe." What the group wanted was an ability to match the MIG-15 in climb, ceiling, and top speed: "When a man goes hunting with a gun," the study pointed out, "he's got to get close enough to whatever he's after with that gun to kill it."<sup>155</sup> On 26 December 1951 a man who had fought in Korea, Col. J. C. Meyer, who before his recent return to the United States had commanded the 4th Wing, wrote Lt. Gen. Earl E. Partridge, who had formerly commanded the Fifth Air Force but now commanded the USAF Air Research and Development Command, concerning the subject which was uppermost in the minds of combat Sabre pilots: improvement of the Sabre's performance. Quite promptly, on 11 January 1952, General Partridge established an A-1 priority ARDC program designed to increase Sabre performance. Three avenues of approach to the problem were ordered explored: reduction of the weight of the Sabre, reduction of the drag of the Sabre, and increasing the war emergency thrust of available Sabre engines.<sup>156</sup>

**Thrust Augmentation:** As the Wright Air Development Center (WADC) got to work on this crash project, improving the F-86 performance by the reduction of its weight sounded very feasible, but investigations soon demonstrated that while equipment adding to the basic airframe could be stripped off there was no way to get rid of the extra weight which had been built into the airframe to accommodate this equipment. North American Company engineers drew up plans to reduce the Sabre's weight by 2,800 pounds, but these plans required a virtual redesign of the airframe which would take about as much lead time to effect as the production of an entirely new aircraft.<sup>157</sup> Any immediate reduction of the Sabre's weight was therefore infeasible.

Some good progress was made in increasing the thrust of existing Sabre engines. Representatives of North American, who reached Korea in March 1952, demonstrated that a slight readjustment of the nozzle area of the tailpipe would increase its temperature by 70° centigrade and permit the use of full-rated thrust at altitudes above 35,000 feet. In October 1952 the installation of needle valves to change fuel spray patterns allowed Sabres to maintain a constant tailpipe temperature of 690°

from the ground to 40,000 feet, so contributing to full-thrust operations at high altitudes.<sup>158</sup>

There was some initial hope that over-temperature operations of a Sabre engine for short periods might be practicable: tests showed that at 820° a J-47 engine delivered approximately 15 percent more thrust at 35,000 feet, but the same tests demonstrated that such a practice would be so deleterious as to be impracticable in Korea, where logistical support was already marginal. Two other projects were undertaken to secure thrust augmentation. Water-alcohol injection already was used to increase the thrust of jet engines on takeoff, and tests indicated that water-alcohol injection at altitudes of 40,000 feet would give a substantial burst of power without substantially decreasing engine life. The disqualifying defect of this technique, however, was the extra weight of the additive and the apparatus required. In order to provide two minutes of water-alcohol injection at 40,000 feet, some 1,000 pounds of fluid and apparatus had to be added to the total weight of the aircraft. This possibility was therefore laid aside in favor of pre-turbine fuel injection, which promised to create an after-burner effect in the normal combustion chamber of the J-47 engine. Although tests of preturbine injection were very promising, long term developmental work was required and nothing in this line would become available for operations in Korea.<sup>159</sup>

In an effort to better the burst performance of the Sabre, North American engineers in May 1952 installed three solid fuel rocket bottles on this fighter. Each of the bottles developed 1,000 pounds of added thrust, and they could be fired simultaneously with a burning time of 14 seconds or in overlapping sequence with a time of 38 seconds. The additional thrust provided a noticeable but not outstanding improvement of performance: in a climbing turn the increased thrust increased speed by about 20 knots. While the drag of the installation was negligible, the weight penalty was on the order of 600 pounds before the rockets were fired and 450 pounds after they were fired.<sup>160</sup> By early August 1952 five of these rocket kits were in Korea, and subsequent combat testing soon demonstrated that the added thrust was not sufficient to warrant the additional weight and impaired maneuverability of the aircraft at high altitudes. Pilots said that it was quite difficult to stabilize the Sabre when the rockets were fired,

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and one pilot reported that the ensuing disturbance had actually prevented him from destroying a MIG. Combat tests were accordingly ended in November 1952, and the installations were removed from test aircraft. The final FEAF report stated that the rocket installation was unsatisfactory because the short duration of added thrust made timing of employment extremely critical, they were an added weight penalty, the installation created longitudinal instability which reduced maneuverability, the duration of the thrust was too short and the thrust itself was insufficient, the turnaround time on rocket-equipped aircraft was almost three hours instead of a normal 30 minutes, and, finally, the rocket smoke betrayed aircraft positions.<sup>161</sup>

**Solid Leading-Edge Wings:** The most significant development on the Sabre which would be of value in time for the Korean operations lay in the reduction of its drag. In deference to the stall characteristics of a swept-back wing, the Sabre had been designed and manufactured with standard leading-edge wing slots. For experimental purposes, however, the North American Company retrofitted one F-86E with extended, solid leading edge wings. Colonel Meyer flew this modified plane and reported enthusiastically in December 1951. Late in January 1952 test pilots at the WADC also obtained favorable results from an F-86 whose wing slots were sealed with fabric and dope, and, while flight tests with the proposed modification were still underway at Edwards AFB, the Fifth Air Force, on 26 April 1952, signaled its impatience to service test the solid leading edge modification in combat.<sup>162</sup> The Edwards tests soon showed that the new solid leading edges, which increased each wing chord by six inches at the base and three inches at the tip, were a "noteworthy improvement." Such tip-stalling characteristics as the modified wing brought could be reduced by the installation of a small flow fence on the upper wing surfaces.<sup>163</sup>

When the first four of an initially ordered 50 leading edge wing kits were ready a WADC team left with them for the Far East on 28 July 1952. By 18 August, three 51st Wing F-86F's had been modified and put into combat. The pilot response was highly enthusiastic, and the project officer 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

procurement and delivery of sufficient "6 x 3" leading edges to retrofit all F-86E and F-86F aircraft assigned to the Fifth Air Force. Procurement of additional kits for modifying all Fifth Air Force Sabres was initiated in September 1952.<sup>164</sup>

As employed in Korea the Sabre with solid leading edge wings demonstrated substantial advantages over those with the older wing configurations. It climbed faster and had greater level flight speeds at all altitudes; there was a significant improvement in available "G-loadings," particularly from .85 to .95 Mach where maneuverability of the unmodified aircraft was poorest. With drag decreased, the cruising range of the modified aircraft was automatically increased. In short, the modified Sabre could out-maneuver its unmodified equivalent, particularly at high altitudes and high Mach, and it had improved high speed performance. At high Mach numbers at all altitudes the accelerated stall characteristics of the modified aircraft were superior. The modified Sabre required larger traffic patterns and hotter landings since the stalling speed of the solid leading edge was approximately 10 knots higher than the slot type leading edge, but as one combat pilot remarked: "Since the air war is not won in the traffic pattern these characteristics cause little concern."<sup>165</sup> With some additional development, which would not be completed in time to see service in Korea, it would be possible to add fuel cells in a "wet" extended leading edge configuration, thus allowing the Sabres internal fuel roughly equivalent in added range to the two 120-gallon external tanks habitually carried for operations in Korea.

**Improved Combat Performance of the Sabre:** When the F-86F, with its higher thrust engine, was equipped with the solid leading edge wings, the Sabre series finally reached a performance nearly equalling that of the best of the MIG-15's. That the solid leading edge planes were in combat, however, was one of the best kept of USAF technical secrets, and this modification was mysteriously mentioned by the American press as the "new secret device" and "new combat device" which was resulting in increased MIG kills. By late March 1953, Col. James K. Johnson, commander of the 4th Wing, could state with some exaggeration that "the performance of the F-86 and MIG-15 are practically equal," provided the F-86 was maintained in peak condition.<sup>166</sup> In

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April, however, FEAF nevertheless informed the ARDC that "MIG kills are continually lost each day due to the inability of the F-86 to close on the MIG." FEAF wanted still more thrust augmentation for the Sabre which would permit it to "obtain complete air superiority."<sup>167</sup>

That the improved performance of the F-86 Sabre contributed to the successful kills of MIG-15 aircraft in the final months of the Korean war is undoubtedly true. Thus in May and June 1953 the percentage of engaged MIG's which were destroyed jumped from approximately 5 to 15 per-

cent, and this improvement was no doubt due to the improved performance of aircraft and armament systems.<sup>168</sup> But, as is the case with most glib generalizations, it would be erroneous to ascribe the Sabre victory to any "new secret device." Much more judicious and aptly describing the improved situation was the already noted statement of General Anderson, who said: "The Fifth Air Force maintained air supremacy through an adequate combination of the technical capabilities of its fighter aircraft with superior individual pilot proficiency, flight integrity, and air tactics."<sup>169</sup>

#### NIGHT COMBAT OVER NORTH KOREA

**Augmentation of Red Night Air Defenses:** By a change-over to night shoran bombing techniques, the FEAF Bomber Command in November 1951 regained an ability to operate freely over northwestern Korea.\* Just as promptly, however, the Communist enemy began to figure out and implement countertactics to these night bomber operations. In September 1951 the enemy had already begun using radar for searchlight control; that the Reds were using S-band gun-laying radars was evidenced in October 1951, and this type of radar was shortly confirmed in the vicinity of Sinuiju, Sinanju, Namsan-ni, Taechon, and Pyongyang. Employing the airfields at Sinuiju, Uiju, Antung, Ta-tung-kou, and Ta-ku-shan to support night air operations, the Communists began a serious effort to use for their night defenses, a variety of day fighter aircraft including such jets as MIG-15's, Yak-15's, and Type-15's, Type-8's and such piston aircraft as LA-5's, LA-7's, LA-9's, Yak-9's, Yak-11's, and IL-10's. First damage to a UNC plane by Red night fighters occurred on 16/17 November 1951 when two interceptors caught a night intruder B-26 in a searchlight cone near Sunchon and sent it limping home with major damage. On 23 December 1951, when the 19th Bombardment Group attacked Uiju airfield with 8 B-29's in clear weather, the Reds demonstrated coordinated fighter-searchlight tactics. A majority of the bombers were illuminated, and two of them were damaged by enemy fighters.<sup>170</sup>

Fifth Air Force radar surveillance of the skies over North Korea nevertheless revealed that the Communists laid no quantitative stress on night

air operations until June 1952, the same month during which it was noted that their coordinated day fighter defenses apparently went into operation.<sup>171</sup> After June 1952 the Reds effected an air defense of northwest Korea which was even more hazardous to UNC night air operations in that area than it was to the day air operations which have just been reviewed. As was the case in day operations, the MIG-15 was probably the meanest of the aircraft which UNC pilots met at night over the enemy territory. But, in common with the other day fighters which the Communists employed for night defense, the MIG-15 lacked airborne intercept (AI) radar. Either the Communists did not have this radar, or else they did not wish to jeopardize their EWP by employing it, but, whatever their reason may have been, the Reds never employed airborne intercept radar over North Korea. This meant that Red night fighter pilots had to visually identify a target at night before they could fire on it. Judged from performance comparisons with equivalent American equipment, the Communist CPS-6 type GCI radar at Antung had a capability to position a Red jet type fighter within 2 to 5 miles to the stern of a UNC bomber at a distance up to 70 miles out, but in order to make a kill the Red night fighter pilots had to follow through on a crash course until they could catch some glimmer from their target. Since this was manifestly very difficult, the Reds made few attacks against FEAF aircraft during the time in which these aircraft were dispersed enroute to or returning from targets. Instead the enemy pilots concentrated their defensive efforts in the space between the bombers' initial point and the target (usually some 40 nauti-

\*See AHS-72, pp. 179-85.

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cal miles or 9 minutes for B-29's flying a shoran arc), at the target, and in the general area of the breakaway from the target. Lacking enough gun-laying radars and needing to use day fighters in night fighting roles, the Reds made extensive use of searchlights.<sup>172</sup>

**Vulnerability of UNC Aircraft to Night Air Defenses:** Flying generally at fairly low levels against diversified targets and enjoying the protection of dispersion and mountainous terrain, over which pursuit was hazardous, Fifth Air Force night-flying B-26's frequently sighted unidentified aircraft but were not too often molested by Communist night fighters. These light bombers were not routinely employed in the area north of the Chongchon River, and the night intruder crews were enjoined to maintain a constant alert against enemy night fighters, especially when flying at higher altitudes to and from their assigned reconnaissance and target areas. So far as was known, no B-26's were lost to enemy night fighters during the last year of Korean hostilities. As a matter of policy the light bombers attempted to avoid known flak traps and areas heavily defended by antiaircraft artillery, unless their assigned targets lay within such areas. Communist mobile automatic-weapons and small-caliber fire could be expected at almost any time over the main supply routes, and as a measure for conserving the light bombers against unnecessary loss the Fifth Air Force generally required them to maintain attacking altitudes of 4,000 feet and permitted only select night intruder crews to attack at lower levels.\* Not even these restrictions could preserve the light bombers against enemy flak, and in the months of combat from July 1952 onward a total of 23 of them were lost due to enemy action.<sup>173</sup>

Unlike the light bombers, the B-29 medium bombers of the FEAF Bomber Command were vulnerable both to hostile antiaircraft artillery and night fighters and, during the last year of the Korean war, had no choice but to operate in a situation which lent almost every advantage to Communist night defenses. The most lucrative medium bomber targets remaining in Korea were in the northwestern extremity along the Yalu, where Red flak, searchlights, fighters, and radar facilities were the thickest. A combination of shoran techniques and the smallness of the target area

\*See Chap. IV, pp. 110-11 and Chap. V, pp. 160-61.

negated any great possibility of deception. Medium bomber feints or other diversions designed momentarily to confuse hostile GCI had little potential value since the bombers would thereby have to spend more time over enemy territory, while the speed of MIG interceptors was such that they could be easily recalled from misleading vectors: a MIG, for example, could reach Pyongyang within 15 minutes after its takeoff at Antung. Geographical limitations also necessitated fairly fixed medium bomber routes and coast-in points over Korea, but these routes and points were changed as much as possible.

The stereotyped tactics possible with shoran added most to medium bomber vulnerability. Only one station pair of shoran arcs could be used for radar bombing in northwestern Korea, thus permitting a maximum of four arcs over a given target and even fewer arcs if the target lay near the Yalu. When the Reds became familiar with these shoran arcs they concentrated flak defenses along them, and quite frequently the Reds were able from their past experience to figure out what the target was going to be before the bomb run was much farther along than the initial point. Over northwestern Korea a combination of the service ceiling of the medium bombers and the altitude at which shoran pulses could be satisfactorily received allowed the medium bombers no great variation in bombing altitudes: with a full bomb load, a B-29 had a service ceiling of approximately 26,000 feet, and over Sinuiju dependable reception of shoran pulses could not be had below 23,000 feet. In the winter months, moreover, condensation of vapor trails formed at increasingly lower levels and acted as pointers exposing the locations of the medium bombers. In January and February 1953 the contrail level on some nights went down as low as 19,000 feet, so that there was no escaping these contrails. Over northwestern Korea in the last year of the war, any means of tactical deception available to the medium bombers was least possible in the very area of the most lucrative targets.<sup>174</sup>

**Medium Bomber Losses to Red Night Defenses:** For eight months after November 1951 the medium bombers utilized darkness and shoran techniques to operate over North Korea with near impunity, but on the night of 10/11 June 1952 the Reds demonstrated that their defenses had caught up with the change in B-29 tactics. On this clear

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moonlight night, 11 B-29's of the 19th Bombardment Group were sent to bomb the railway bridge at Kwaksan, just west of Chongju. Searchlights locked on each successive B-29 of the 35-minute long bomber stream, while at least 12 MIG fighters prosecuted coordinated attacks, apparently under the guidance of a Red air commander who flew parallel to the bombers. One B-29 exploded over the target, a second went down from a fighter attack which hung on tenaciously through the breakaway, and a third received such major damage that it was forced down at Kimpo. The only B-29 in the stream which escaped the merciless glare of the searchlights had been the last one over the target, and it had employed electronics countermeasures (ECM).<sup>175</sup> Having drawn their first blood, the Red night fighters continued to be aggressive. On the night of 12/13 September, hostile fighters worked again with the searchlights to destroy a 307th Bombardment Wing aircraft over Sui-ho. On the night of 18/19 November the Communists revealed another tactic when they shot down a single 98th Bombardment Wing B-29 which had just bombed the Sonchon supply center: shortly after bombs-away an enemy aircraft, riding directly above the B-29, dropped a series of three flares, one each time the bomber changed direction. These flares enabled some 20 searchlights to lock on the bomber for fully four minutes, in which time four fighter passes so badly riddled the bomber that its crew abandoned it off Cho-do (island).<sup>176</sup>

During December 1952 and January 1953 the Communists made extreme efforts to drive the medium bombers out of the skies over northwestern Korea. The B-29's picked up searchlights almost everywhere north of the Chongchon, and there were fairly positive reports that two Russian night fighter units were keeping a standing patrol of seven or eight MIG's airborne between the Chongchon and the Yalu and that they augmented this patrol as necessary when the B-29's came on Red GCI scopes.<sup>177</sup> On the night of 30/31 December, when the moon was full and directly overhead and contrails were streaming at the 25,000-foot bombing altitude, three 19th Group B-29's were coned by searchlights as they attacked an ore processing plant at Choak-tong. While a propeller-driven aircraft flew above the bombers, flashing alternate red and white lights, Communist fighters came in to shoot down one B-29 and

damage two others so badly that they were forced down at Suwon.<sup>178</sup> Bomber Command attributed these losses to the moonlight and to the contrails, but on 10/11 January 1953 a 307th Wing plane, in the dark of the moon but drawing light contrails, was illuminated by some 18 searchlights, hit by flak, and then shot down by fighters over its target area, the Anju marshalling yard.<sup>179</sup> Again on 12 January a lone 91st Reconnaissance Squadron RB-29 which was dropping leaflets along the Yalu was shot down. Not much was known of the details of this attack other than that the RB-29's radar track was intercepted by some 12 enemy fighters. On 28/29 January, again in the full of the moon but without assistance from either contrails or searchlights, enemy fighters shot down a 19th Group B-29 over Kompodong; apparently these fighters silhouetted the bomber against the moon and required no other illumination. On 30/31 January these same tactics were repeated against a 307th Wing mission which bombed the Unjong-ni supply area; some 10 aggressive Red fighters prosecuted attacks which sent one bomber badly damaged to an emergency landing in South Korea. The Communists had now demonstrated an ability to make effective attacks by moonlight, without the assistance of searchlights or contrails.<sup>180</sup>

The total number of these Red night attacks was not great: Bomber Command reported only 20 non-firing and 23 firing passes made against its aircraft in January 1953. But the loss of four B-29's in such short order indicated that the Communists were doing their best to force a reduction in medium bomber operations. Their coordination was good: they were using moonlight and contrails for visual identification and for follow-up attacks, controller aircraft for coordinating fighter passes, and GCI for vectoring the interceptors to the vicinity of the medium bombers. Although searchlights stood ever ready for the task, and flares had been put into use, the Communists were using moonlight for the identification of their air targets. In the two attacks at the end of January, moreover, the Reds had made their first confirmed use of aerial rockets, one report stating definitely that a MIG had launched six of these missiles from positions under its wings.<sup>181</sup>

To Bomber Command and to its commander, Brig. Gen. W. P. Fisher, January 1953 was a desperate month. "The air war," wrote General

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Fisher, "is getting tougher all the time from our viewpoint. We are using every bit of ingenuity and changes in tactics we can think of to get by without losses, but it is getting pretty tight." Shortly afterwards, General Fisher again described the situation which was facing the FEAF Bomber Command as its old B-29's operated over North Korea:<sup>182</sup>

The Communists have developed their GCI capability extremely well. They have an abundance of well-trained, highly skilled night fighters; they have built up their searchlight defense considerably; and finally, they have developed tactics and techniques of using them very well. The only link missing needed to give them a really effective defense system is the reliable establishment of contact at the last moment to enable their fighters to accurately bring their armament to bear on our B-29's.

### COUNTERING THE COMMUNIST NIGHT DEFENSES

**Adjusting Attacks to Weather:** For some time prior to Kwaksan Bomber Command had been seeking a means of reducing the advantages which the inflexible shoran arcs permitted to Communist defenses. Since Red night fighters lacked airborne intercept radar and since the Reds did not have enough gun-laying radars, the surest way to avoid medium bomber losses was to keep these vulnerable aircraft out of searchlight-defended areas except at such times as there was instrument weather or at least enough undercast to baffle the lights. Cognizant of the situation, FEAF gave the word on 28 June 1952 that the medium bombers would not attack heavily defended searchlight areas except on special order. The efficacy of timing medium bomber attacks to coincide with bad target weather was demonstrated on the night of 30 July 1952, when 60 B-29's in the largest medium bomber night strike against a single target in the Korean war destroyed the Oriental Light Metals Company, only four miles from the Yalu and eight miles from Sinuiju. The bomber stream reported some 87 sightings of hostile fighters and received 33 firing and 9 nonfiring passes, but a thin undercast at 12,000 feet baffled the hostile searchlights and all the B-29's escaped damage.<sup>184</sup>

But the dependence upon bad weather for covering B-29 attacks against searchlight defended targets did not promise complete satisfaction. Weather predictions were so frequently inexact that an airborne commander in a lead ship had to reconnoiter targets in advance of the main bomber

stream. If there was not enough cloud cover, the airborne commander was hazarded, and even if there was enough cover to warrant bringing in the bomber stream the lead plane, having had to fly a longer mission, would have had to carry a reduced bomb load. Dependence on bad target weather for bombing, moreover, meant that only a fraction of Bomber Command's destructive potential could be exploited on a when and as needed basis. "Given 60 hour notification," stated Brig. Gen. Wiley D. Ganey, commander of the FEAF Bomber Command, in August 1952, "60 B-29 aircraft can be placed within 1,000 feet of any target within shoran range. To limit such a force to bad weather conditions indicates that targets remaining in North Korea either are not suitable for medium bombing or that the Air Force is at the mercy of a defensive tactic discarded as outmoded . . . five years ago."<sup>185</sup>

By October 1952, however, two missions had demonstrated that searchlight suppression was infeasible and tests had shown that Thunderjet day fighters could not escort night-flying B-29's;\* thus it still appeared that the only way in which the medium bombers could attack sensitive targets on the Yalu was to time such attacks to coincide with instrument weather over the targets.<sup>186</sup> During October, General Weyland had been quite anxious to get medium bomber strikes laid against military targets in Sinuiju and on the airfield at Uiju, but he agreed to Bomber Command's proposal that

\*See pp. 74-75.

such strikes would have to be delayed until after mid-November, when the weather pattern was expected to change and the medium bombers could expect clouds over these heavily defended targets. But when, on 28 November, Bomber Command finally ran the delayed mission to Sinuiju, expecting to find predicted instrument weather at this target, the 44 bombers were instead met with a clear, bright night, with not a cloud in the sky and the moon at its zenith. Fortunately, Bomber Command had not solely relied upon the predicted bad weather but had worked other tactics into its mission plans: three bomber forces, separated by 45-minute intervals, were each directed to cross the target within five minutes (bucking the headwinds encountered, however, required 10 to 15 minutes over the target), while enough separate shoran aiming points were assigned to allow 10 separate initial points and approaches. All ECM equipment in the command was employed, both electronics jamming and chaff. The overall results were fortunate: despite a target defense of some 116 heavy guns, 94 of them controlled by radar, only two aircraft received minor flak damage. Although 40 searchlights probed the sky and nine enemy fighters tried to intercept, only one enemy firing pass was made and it was ineffective. After this mission to Sinuiju, Bomber Command recognized that the accuracy of forecasting required successfully to utilize weather cover could not be obtained, and it gave up further efforts to use weather predictions as mission planning factors.<sup>187</sup>

The phase of the moon and atmospheric conditions resulting in contrails were more predictable matters, and after the medium bomber losses in December 1952 and January 1953 were attributable to these causes, General Fisher took the problem to General Weyland. As the result of the agreement reached between these two officers, Bomber Command during February 1953 launched no attacks in the area between the Chongchon and the Yalu in periods of bright moonlight, nor were targets attacked which required a flight altitude at contrail forming levels. General Fisher disliked this policy, representing as it did a reduction in his force capability, but it paid dividends: that month only one 98th Wing B-29 was damaged, this occurring on 14 February and accomplished by a coordinated fighter and flare attack.<sup>188</sup> In March 1953 the contrail level

began to lift and soon was no problem at medium bomber attack altitudes; the weather also began to worsen over northwestern Korea, and thereafter Bomber Command operated into this heavily defended area with more liberty. The factor of moonlight was nevertheless continued as a matter of consideration in planning medium bomber missions into the sensitive area.

**Failure of Searchlight Suppression:** Believing strongly that the Communist fighter-searchlight combination promised future bomber losses when important targets were attacked, General Ganey on 22 June 1952 requested and FEAF subsequently directed that the Fifth Air Force would discover a means of suppressing searchlights.<sup>189</sup> Bomber Command suggested that B-26 light bombers might orbit in a target area and use frag bombs and rockets against searchlights, or perhaps the B-26's might be able to lay smoke screens, creating artificial clouds over the target.<sup>190</sup> For its own part, Bomber Command asked permission to use the small HAIL or LAZY DOG weapons (free-falling, finned bullets, carried in great numbers in B-29 hoppers, and designed primarily for antipersonnel use) against searchlights, but FEAF was unwilling to relax its policy that this weapon would be used only against major enemy troop concentrations in conjunction with friendly or hostile ground offensives.<sup>191</sup>

The Fifth Air Force appeared unenthusiastic concerning searchlight suppression, mainly because at best it promised no more than partial success.<sup>192</sup> At General Ganey's urging, however, an experimental mission was run on the night of 12/13 September, when, in clear weather, the medium bombers made a follow-up attack against the Sui-ho hydroelectric plant. Six B-26's attempted to suppress searchlights: first an airborne command B-26 established a control and orbit point from which the second B-26 proceeded to the target with the first B-29 and the remainder of the light bombers attacked at 25-minute intervals thereafter. The Fifth Air Force had thought that the searchlights would be located around the outer perimeter of the target and that the guns would be inside this perimeter, but such was not the case at Sui-ho, and the B-26's were compelled to fly through the flak defenses. Under this circumstance the M-90 flares which the B-29's dropped to give the light bombers a ground reference did more harm than good, since they exposed

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them to ground fire. Altogether the light bombers destroyed only 8 out of 30 or more searchlights (a part of them were across the Yalu and out of bounds), and at no time did the guns or the lights leave the B-29's. Bomber Command, however, had not entirely depended upon the searchlight suppression: 6 ECM B-29's got through to take up orbits about 20 miles east of Sui-ho, where they jammed the hostile radars while 29 other bombers attacked the hydroelectric plant. The aircraft over Sui-ho met box-barrage flak, heavy and intense, this type of fire control evidently being used because of the ECM jamming. A number of the attacking bombers were damaged by flak, and the lead 307th Wing underwent fighter attack which exploded one of its planes over the target. After this mission was over, the Fifth Air Force noted that its searchlight suppression efforts had been "unsuccessful," but FEAF nevertheless concluded that a combination of ECM, chaff, and searchlight suppression had saved the medium bombers from much higher losses.<sup>103</sup>

Much the same tactics were again attempted on the night of 30 September/1 October 1952. In this mission 48 B-29's, including 3 which first suppressed flak and searchlights with frags and then established an orbit from which they jammed enemy radars, effectively attacked the Namsan-ni chemical plant near the Yalu. Seven B-26's managed to suppress 8 out of 40 searchlights, and the remainder of these lights were kept sweeping wildly by the ECM and made only five short lock-ons. Flak was heavy, moderate to intense, and accurate, and several bombers were damaged, but none of the Red night fighters in the area were able to make successful firing passes.<sup>104</sup> General Ganey expressed his personal appreciation for the searchlight suppression, but once again the Fifth Air Force reaction was that its B-26 effort amounted to no more than a harassment.<sup>105</sup> FEAF conceded that searchlight suppression had not been 100 percent effective but observed that "the missions were successful in that some of the searchlights were destroyed and others rendered less effective." Colonel E. B. LeBailley of the 3d Bombardment Wing considered that the missions were "substantially successful within the bounds laid upon the U. S. aircraft by higher authority," but such searchlight suppression tactics would not be again employed during the Korean hostilities.<sup>106</sup>

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**Fighter Support for the Medium Bombers:** At the same time that the searchlight suppression experiments were being run, both the Fifth Air Force and the FEAF Bomber Command were investigating the feasibility of providing fighter support for the medium bombers. The Fifth Air Force possessed one squadron of night interceptors—the 319th Fighter-Interceptor Squadron, based at Suwon (K-13)—but this unit's F-94B aircraft had on board the latest USAF E-1 fire control system, and, rather than have this equipment compromised by the loss of an aircraft over hostile territory, USAF had dictated that these planes would be confined to use in local scrambles under positive GCI radar control and at no great distance north of the bomb line.<sup>107</sup> This restriction greatly limited the Fifth Air Force's capability, when, after June 1952, it set about providing night fighter combat cover in support of medium and light bomber attacks. The only aircraft which it could possibly use were conventional F7F's belonging to Marine Squadron VMF (N)-513, which had older, already theoretically compromised airborne intercept radar. Beginning in July 1952 this Marine squadron made available some four planes nightly for supporting the medium and light bombers. Bomber Command used these Marine night fighters to precede its bomber stream by about five minutes and to patrol the stream from the IP to the target. On other occasions the Fifth Air Force used these same planes to good purpose: the presence of the Marine night fighter cover, said the Fifth Air Force director of operations, was the prime factor in the success of light bomber rail reconnaissance attacks made in the seldom-visited northeast Korean coastal area during September 1952.<sup>108</sup>

Lacking a sufficient night fighter capability for the tasks presenting themselves, FEAF authorized Bomber Command and the Japan Air Defense Force to test the practicability of using day fighters for the support of medium bomber night operations. Already in an effort to destroy the Red airborne commanders who customarily hovered about the area where medium bombers were under attack, the Fifth Air Force had experimented unsuccessfully with a couple of F-84's, which had no airborne radar but depended on friendly GCI to place them in the same area with enemy night-flying aircraft.<sup>109</sup> During August

and September 1952 the FEAF Bomber Command and the JADF utilized their 98th Bombardment and 31st Fighter-Escort Wings in a project called NO-GLO, designed to determine whether F-84G day fighters could escort medium bombers at night and perhaps knock out a few searchlights in the target area. A maximum of two F-84's did prove able to fly along with a single B-29 at night, but it was evident that such escorting day fighters "would be completely ineffective against enemy night fighters." Moreover, no effective flash suppressor equipment could be had for the guns carried by the F-84G's, and without such equipment the fighter pilots could not simultaneously strafe and retain their needed night vision. NO-GLO, in a few words, had no promise of helping the medium bombers.<sup>200</sup>

Despite the failure of NO-GLO and the fundamental limitations of the conventional F7F's (commander, 1st Marine Air Wing, called them "completely ineffective" for battling Red jet night fighters<sup>201</sup>), the Fifth Air Force remained highly interested in the support for bombing operations. In early November 1952, VMF (N)-513 secured 12 F3D-2 Skynight all-weather jets, which were available for use in North Korea: possessing an older type AN/APG-26 radar ranging system, these jets could make deep penetrations without the danger of compromising new equipment. These F3D's initially provided "barrier cover"—patrols 20 to 50 miles north of the attacking bomber stream—which was credited by General Fisher with "some small degree of success" since it turned back some enemy interceptors. This barrier cover also destroyed two enemy aircraft: on 3 November a Skynight pilot got the first night kill, jet versus jet, when he was vectored by GCI to shoot down a Yak-15 near Sinuiju, and on the night of 8 November northwest of Sonchon<sup>202</sup> another F3D shot down an aircraft believed to be a MIG-15.

During November 1952 the Fifth Air Force got permission to use its F-94's for deep penetrations into North Korea: presented with the problem while he was visiting in the theater, General Vandenberg personally authorized the Fifth Air Force to remove the restrictions on the employment of these all-weather fighters.<sup>203</sup> The 319th Squadron was accordingly directed to utilize a part of its strength in flying escort for the B-26 light bomb-

ers and for maintaining night screens between the Yalu and the Chongchon rivers.<sup>204</sup>

Successes of Red fighters against the medium bombers during January 1953 bespoke the need for increased friendly fighter support, but neither the extent of the friendly radar control nor the strength of night fighters allowed much expansion of the system. The Cho-do GCI was unable to control more than four interceptors at one time, and the number of all-weather fighters available to the Fifth Air Force remained pegged at 12 F3D's and something less than 25 F-94's. In January 1953 the 1st Marine Air Wing commander requested 12 additional "highly effective" F3D's to replace an equivalent number of "completely ineffective" F7F's, only to be informed by CINC Pacific Fleet that night air defense in Korea was primarily a USAF responsibility and that maintenance considerations would have to temper any immediate granting of the request.<sup>205</sup> The 319th Squadron remained continuously short on an average of 5 out of 25 authorized F-94's due to the critical shortage of these aircraft in the USAF; not until early July 1953, when it was necessary to build all units up to strength in order to be present and counted as the armistice went into effect, was the 319th Squadron brought up to strength.<sup>206</sup>

Although the potential in the form of aircraft needed for the performance of the night bomber support mission remained scanty, a joint conference at Fifth Air Force headquarters on 27 January 1953 devised joint procedures designed to get maximum cooperative results.<sup>207</sup> Since their radars could receive IFF emanations from the B-29's, the F3D's were assigned a close escort role. Earlier that month in response to a Bomber Command request for "overhead cover" the F3D's had begun to position themselves at the bomber IP and, holding an altitude 2,000 to 3,000 feet above the big aircraft, they followed the bomber stream to the target and through the target breakaway. If a bomber was coned by searchlights, the F3D's sought to cover its tail. Using these tactics, the F3D's got two kills, one each on the bright moonlight nights of 28 and 31 January 1953.<sup>208</sup> The Fifth Air Force conference determined that F-94's could best be employed in night barrier counterair patrols. On such a patrol on the night of 30 January 1953, Capt. Ben L. Fithian and his observer, Lt. Sam R. Lyons, shot down an LA-9 for

the first kill by an F-94B in Korea; the victory was made in completely blind firing, at minimum airspeed and altitude, the F-94 firing by radar from 600 through 200 yards range.<sup>200</sup>

The procedures and tactics agreed upon at the Fifth Air Force conference were employed without especial change until the last weeks of the Korean war. Dispatched in numbers ranging from 4 to 6, the F-94's maintained counterair patrols under GCI direction at a point about 30 miles in advance of the medium bomber target. For the usual escort mission, 9 F3D's were scheduled, with 2 of them serving as spares, to accompany the bomber stream along the initial point-target-target breakaway route. These escorting aircraft employed either "racetrack" or "pacer" tactics, the former requiring them to orbit above and outside the bomber stream and the latter obligating them to keep pace with the bomber stream at spaced intervals above and outside of it. One or more F3D's additionally provided a "target CAP," orbiting the target in a combat patrol. Some 20 minutes prior to the bomber time on target, both escort and barrier aircraft were required to report to a controlling TADC, and they were vectored to intercept such hostile aircraft as might be within the area. After the bomber stream approached its target, however, the TADC did not vector escort aircraft away from its vicinity, unless the plane was in "hot pursuit" with an airborne intercept radar contact on a suspected hostile aircraft. In the last weeks of hostilities, when most B-29 targets were at or near the Yalu, the F3D's were additionally assigned such barrier patrols as could be flown in the restricted area of operations.<sup>210</sup>

How effective these escort and barrier fighter patrols were in shielding the medium bombers from hostile fighter attack could never be exactly determined. Both F3D's and F-94's demonstrated abilities to destroy enemy aircraft, and the 319th Squadron added to its initial kill with victories over high speed jet aircraft on 10 May and 12 June 1953.<sup>211</sup> Since the enemy's effort against individual bomber missions remained unknown, it was difficult to determine just how many enemy fighters may have been turned back by the presence of the all-weather fighter escort. Bomber Command nevertheless stated that: "numerous unidentified aircraft approaching the bomber stream were turned back by the escorting or bar-

rier fighters, and although fighter escort did not prevent attacks, it was a great morale boost for the aircrews to know that there were friends out there in the dark as well as enemies."<sup>212</sup>

**Compression of Bomber Streams:** Of capital importance in the revised Bomber Command tactics was the effort to achieve a high degree of compression of the bomber stream in the time and space above its targets. The bomber stream which attacked Namsan-ni on 30 September, for example, took two hours to get over the target, a long enough period of time to permit the enemy to give each bomber his full attention. As a matter of highest precedence in October 1952, Bomber Command therefore emphasized compression of its bomber streams, reducing the planned lateral interval between individual bombers from three minutes to one minute. Whenever possible, moreover, the bomber stream was assigned as many as four shoran aiming points, so that several aircraft could attack simultaneously, if desirable, from different headings, each crew using the altitude hole of the AN/APQ-13 radar to assure that there was bombing clearance below. A kindred technique was to assign two or more shoran points as close together in a target complex as 500 feet which sections of the bomber stream, flying parallel shoran arcs, bombed simultaneously. This technique and the use of one minute time separation meant that within a space 1,000 feet wide by 8 miles long there could be as many as 9 strike aircraft, each giving mutual support to the other.<sup>213</sup>

Constant practice in compressing the bomber stream enabled the 98th Bombardment Wing to cut its bombing interval down to 1:15 minutes in February 1953; the same wing reported very good results in bombing separate shoran targets simultaneously: seven minutes was the maximum difference between all bombs away and in one case the two leaders of parallel formations bombed their targets only one second apart. The attainment of such close intervals of attack, however, was plagued by the high velocity, hard to predict, winter winds aloft over Korea, which varied with altitude so markedly that low aircraft could easily underfly higher aircraft. Winds aloft predictions, moreover, were so frequently in error that the average bombs-away time was 16 minutes off, early or late. In this situation, the 98th Wing used several techniques to ensure proper spacing between its

strike aircraft: for east coast targets pre-IP radar positioning was used, for enemy targets in the southwestern portion of enemy territory the bombers flew navigation control problems using one of numerous conspicuous radar checkpoints as a control point, for northwestern Korean targets a spacer leg, commencing at a point approximately 10 minutes flying time from the briefed initial point, was flown.<sup>214</sup> These compression tactics continued in emphasis throughout the remainder of Korean hostilities and secured uniformly good results in the form of lower medium bomber casualties. FEAF later noted that: "During the Korean conflict, maximum compression of the bomber force was the outstanding device for reducing overall risk."<sup>215</sup>

**Electronics Countermeasures:** In the spring of 1953 Bomber Command operated over heavily defended targets in the dark of the moon and at altitudes not permitting contrails, always in compressed bomber streams. By these expedients it forced the enemy to depend principally upon his inadequate gun and searchlight control radars for locating the bombers, at the same time that compressed air attack permitted greater concentrations of electronics countermeasures, chaff and electronic jamming, in the target area. The electronics countermeasures (ECM) techniques used in Korea were not new, but many old lessons in their application had to be relearned.

During World War II electronics countermeasures reduced combat losses by as much as an estimated 25 percent, but by 1948 ECM had been largely forgotten and certainly neglected. Although a revitalization of ECM was well underway when the Korean war broke, the first phase of Korean hostilities posed no need for these activities, since North Korean flak and radar capabilities were negligible. But as the Communist defenses increased there was a requirement for ECM. Bomber Command attempted its first electronic jamming on 10 April 1951, and thereafter it accelerated its training program for ECM crewmen. Over Kwaksan in June 1952 the value of ECM was demonstrated when the only B-29 to use it was the only plane to escape hostile searchlights. After this, ECM became a matter of priority emphasis: chaff was first dispensed on the 12 September attack against Sui-ho and electronic jamming was greatly emphasized on this mission. Bomber Command's capability was also enhanced by a re-

organization of ECM planning and using activities. A reconnaissance technical squadron facility was set up to evaluate, collate, and disseminate electronic data obtained by ferret aircraft. An additional enlisted crew member was added to perform ECM duties. Bomber Command's intelligence and operations functions were each augmented by qualified ECM officers.<sup>216</sup>

Even after the "go ahead" authorization was given to medium bomber crews to employ ECM there was a continuous struggle to acquire an adequate supply of the necessary equipment. One problem was the fact that shoran equipment cut the aircraft power available for ECM about in half, with the result that the aircraft had to use limited power output sets, which, however, were generally sufficient for such precision type short range radar as the enemy used for controlling his guns and searchlights. Generally, a B-29's four available electronics racks carried an AN/APR-4 receiver and three jammer transmitters: an AN/ARQ-8 primarily useful against gun-laying radars, an AN/APT-1 primarily useful against GCI and height finder (HF) radars, and an AN/APQ-2 which was primarily used against searchlight control radars. Or a B-29 sometimes carried a receiver, two transmitters, and an AN/APA-11 pulse analyzer. The combinations of jammers usually carried gave each B-29 a capability to disrupt two or three frequencies simultaneously with 10 to 30 watts of limited power. This equipment was of World War II vintage: a few new AN/APT-9 jammer transmitters received by the 307th Wing in May 1953 represented the only postwar equipment used by Bomber Command in the Korean war. Bomber aircraft dispensed two types of chaff: the RR-3A/U rope type chaff supplemented electronic jamming against all low frequency gun-laying, searchlight control, and GCI/HF radars while RR-20A/U chaff provided the only protection against hostile S-Band gun-laying and GCI type radars, no electronic S-Band jammers being available. All aircraft carried at least one carton of RR-3A/D chaff for emergency dropping. The effectiveness of chaff was seriously impaired by excessive dispenser malfunction rates, running as high as 40 per cent, due mainly to deteriorated condition of the chaff tapes, but in the last two months of hostilities improvements in loading techniques, better dispenser maintenance, and increased supplies of

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rayon taped chaff gave a marked increase in effectiveness. The amount of ECM equipment in medium bomber wings remained short of authorized quantities, the R-54/APR-4 receiver and AN/ARQ-8 transmitter being particularly critical. This short supply of ECM equipment used in combat seriously handicapped training since very few sets were available for ground instructional purposes.<sup>217</sup>

To train and make available enough high quality enlisted ECM operators for the B-29 crews proved an all but impossible problem. Prior to September 1952 the 12 ECM operators authorized each wing were presumably competent but actually not all of them were experienced and the wings rarely possessed their authorized quotas. After September 1952 the majority of ECM filler replacements, now authorized at a rate of one per crew, were predominantly inexperienced radio operators and either inadequately or not at all trained in ECM, nor were all bomber units fully manned until just before the war ended. Extensive theater training was required before a filler could qualify as an ECM operator in a combat crew. The end results of the low level of ECM operator proficiency were such as to force competent ECM operators to fly an abnormal number of missions while the poorer operators were not able to execute tactics properly but rather maintained continuous pressure for permission to conduct unlimited barrage jamming, or else laid corollary requests on intelligence to specify the exact frequencies use by enemy radars which would be encountered on a mission.<sup>218</sup>

The tactical usage of ECM in Bomber Command aimed at providing the required protection while disclosing as little as possible of ECM capabilities. While over enemy territory bomber crews were charged carefully to monitor the frequency band from 65 mcs. through 220 mcs. and to accomplish spot jamming any time that a signal reached sufficient intensity to represent a hazard to the aircraft. When more than one dangerous signal was received, first priority was given to searchlight control radars provided enemy fighters were reported in the area or weather permitted effective use of the lights. When the fighter-searchlight combination was not a threat, first priority went to gun-laying radars. The last priority was assigned to GCI/HIF radars. Since the policy was to use ECM only against immedi-

ate threats, no attempt was made to jam early-warning radars. Jamming of high frequency communications used in GCI-fighter direction nets, easily accomplished with a bomber's liaison set plus a special modulator, was allowed only on strikes along the Yalu River, but jamming of very high frequency GCI communications was never allowed, partly because it involved compromise of advanced techniques but mainly because of the priority assigned to intelligence functions monitoring these nets. Over the most sensitive targets continuous drops of chaff screened the bomber from the ground radarscope, a maximum B-29 load of four cartons lasting approximately 8 minutes when dropped continuously at a rate of 20 feet per minute. Emergency drops of chaff—dispensed at a high rate of 40 to 80 feet per minute—were employed only when electronic jamming failed to break searchlight illumination of an aircraft.<sup>219</sup>

As was true with each of the individual tactics adopted by Bomber Command it was impossible to assess exactly what part of the favorable results was due to electronics countermeasures. Compression of the bomber stream, for example, lent peculiar success to ECM since it permitted a much greater concentration of chaff and electronic jamming power in a sensitive target area. In the compressed bomber stream aircraft provided mutual protection, often being covered when experiencing ECM malfunctions. The ECM weaknesses of individual B-29's, such as the lack of a large chaff carrying capacity, the inability to jam more than 2 or 3 signals simultaneously, and the low wattage output of the jammers, were compensated in the compressed bomber stream. Simultaneous attacks along multiple shoran arcs to the same target complex also encouraged the use of continuous chaff drops. ECM nevertheless offered substantial demonstrable benefits, especially against searchlights: during the period 1 January to 27 July 1953, a total of 534 B-29 sorties sighted searchlights and 114 aircraft were illuminated, in which cases ECM caused the searchlights to fall off in at least 87 reported instances. In only 12 instances was ECM reported as ineffectual against searchlight lock ons, but in many of these cases the aircraft were flying in clear weather or drawing heavy contrails, which presumably enabled the searchlight operators to maintain visual contact with them.<sup>220</sup> FEAF concluded that

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ECM was most effective against searchlight control radar, almost as effective against gun-laying radar, and least effective against GCI. Without ECM the official FEAF thought was that the combat losses and damages to the B-29's would have tripled after 1 November 1951. Aside from keeping Bomber Command's losses low, concluded FEAF, one of the greatest benefits derived from the use of ECM in Korea was the re-education of unit commanders, unit staffs, and hundreds of bomber crews in the value and application of these countermeasures.<sup>221</sup>

**Augmenting Medium Bomber Defense Capabilities:** Concurrently with the devising of the tactics designed to thwart the Red's fighters, Bomber Command undertook other actions designed for a better defense of its individual aircraft. On 4 July 1952, as soon as glossy black paint could be gotten after Kwaksan, all units began to give their aircraft protective camouflage for passive defense. All aircraft in the command were supposed to have their undersides painted, but before the work could be completed a mission on 30 July 1952 demonstrated the value of the passive defense: aircraft not painted had searchlights lock on them from 2 to 5 minutes while those that were painted were locked on only up to 30 seconds. Tests run by the 98th Wing also demonstrated that a painted aircraft was some 30 percent harder to see when viewed under searchlight illumination from an intercepting fighter pilot's position in the air. These tests showed that there was no appreciable difference whether the B-29's were painted with glossy or flat black paint, it being practically impossible for a searchlight crew to track visually a camouflaged B-29 at 20,000 feet. At first there was a good bit of indecision as to whether it would be necessary to paint vertical stabilizers, but tests showed that these surfaces were frequently illuminated by searchlights, and on 1 December 1952 Bomber Command issued standardized instructions requiring that all aircraft be camouflaged with black gloss lacquer completely on the undersides up to the centerline of the fuselage and including the vertical stabilizer and propeller hubs. General Fisher felt so strongly on the subject of camouflaging all surfaces which could be illuminated by searchlights that he recommended that all SAC bombers be so painted before commitment to combat.<sup>222</sup>

Before Kwaksan, in recognition of the limited defensive capabilities of the B-29's at night (there were 13 machineguns in turrets but all sighting was visual) and through the belief that gun flashes would simply betray the bombers' position, medium bomber crews had been coached to fire only in last resort. On the morning of 11 June 1952—the morning after Kwaksan—General Ganey called FEALOGFOR asking for flash suppressors and within 48 hours he was furnished four different locally manufactured designs and one standard item. Best of the designs was for a slotted suppressor derived from an APGC paper on flash suppression, and this suppressor was speedily procured and all aircraft were completely equipped with it by the end of 1952. Beefing up of the B-29 armament by the installation of B-50 tail turrets was also expedited, such action progressing to completion in early September 1952.<sup>223</sup> General Ganey also placed an urgent requirement for APG-30 radar tail warning equipment for Bomber Command aircraft; when he took command General Fisher forcibly agitated the need for this equipment; but Bomber Command's priority was too low to get this needed radar and such had not been installed at the end of hostilities.<sup>224</sup>

The ability to exchange fire with enemy pilots greatly boosted the sagging morale of medium bomber crews, but after 24 July, when one B-29 crew shot several holes through another's bomb bay, decision had to be made that crews in bomber streams could fire only at fighters positively identified as hostile or actually attacking the bomber. The need visually to sight the enemy before firing on him greatly limited the effectiveness of B-29 gunnery. Some use was made of the altitude hole of the AN/APQ-13 radar to follow enemy fighter passes originating below the bomber, and friendly GCI could sometimes tell a bomber crew that a hostile fighter was on its tail, but firing contact remained visual, and, although he stressed techniques designed to build night visual acuity, General Fisher noted that in many cases gunners were unable to get a glimpse, or if they saw the enemy jets at all it was at a moment when the hostiles were already passing the bombers.<sup>225</sup> Over the Pyongyang area on 9 September two 343d Squadron gunners were credited with shooting down a Red propeller plane, but doubtless the main effect of the usual bomber fire was merely to blunt the



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ardor with which hostile pilots pressed attacks. This thought caused a reassessment of the policy toward tracer ammunition: it had been long thought that enemy pilots would more easily locate night-flying bombers if the latter used tracers, but a restudy of the matter by the 98th Wing in February, with experienced Marine night fighter crews observing, showed that a solid loading of one turret gun with M-21 headlight tracer would probably have a considerable value in deterring enemy attack. When fired at night the headlight tracer looked like the flash from a 20-mm. cannon with an extremely high rate of fire, and one Marine pilot said that such a burst in his face in the last moment when he poised for visual contact before fring would definitely impair his night vision. The gunners were therefore allowed to draw the headlight tracer ammunition.<sup>229</sup>

Experiments in the Strategic Air Command having shown that exposure to an intense light for only a minute fraction of a second could destroy a fighter pilot's night vision at ranges up to 2,000 yards, two other projects were designed to reduce the visual acuity of Red night fighter pilots. One project in the Far East involved modification of an M-8 pyrotechnic pistol to fire an M-112 photo flash cartridge at intercepting fighters. Nothing much was done with this idea, but concurrently the Wright Air Development Center was working on "Glow Worm," an experimental 500,000,000 candlepower light to be linked with an AN/APG-30 ranging and tracking radar which would track an enemy aircraft until it reached a critical range, at which time it would flash the light in the pilot's eyes, causing him temporary blindness for five or six seconds. This device promised much but it was not available for service test in Korea before the end of hostilities.<sup>227</sup>

**Summary of the B-29 Experience:** Although the B-29 Superfortress had been the premier strategic bomber of World War II, the "old war horse," used disadvantageously in a tactical role proved unable to operate in daylight against the opposition of modern MIG-15 jet fighters in Korea. Having lost six B-29's to MIG attack and one to flak in rapid succession in the period 22 October through 9 November 1951, Bomber Command had shown a commendable versatility in converting its effort to night-flying, highly accurate shoran attacks, which enabled it to continue to strike its designated targets without great loss of efficiency.

The old and weary B-29's had proven unable to operate by daylight against jet interceptors: it appeared doubtful, moreover, that any propeller driven medium bomber could ever again be employed during daylight hours in less than total air superiority. Other than the loss of a 98th Wing bomber to flak on 29 February 1952, Bomber Command operated at night over North Korea with impunity until 10 June 1952 when the loss of two 19th Group B-29's over the not too important railway bridge at Kwaksan signalled that the enemy's fighter-searchlight defenses were becoming effective. Quite promptly, Bomber Command recognized the gravity of this challenge and began to devise countertactics, but these tactics, each valuable in itself, required time to meld and integrate, with the result that in the period 18 November 1952 through 30 January 1953 the Red air defenses were in the ascendancy, costing Bomber Command five bombers destroyed and three others so badly damaged as to require depot reclamation.

After 30 January 1953 Bomber Command's firm adherence to well thought out planning factors effectively negated the ever growing Red air defenses and no more medium bombers were lost. Attacks were scheduled and timed as irregularly as possible; altitudes were varied, the bomber stream was compressed, and multiple shoran approaches were used. Contrail altitudes were avoided, and heavily defended targets were whenever possible attacked in the dark phases of the moon. The B-29's were camouflaged, and medium bomber crew defenses were augmented. Friendly night fighters flew barrier patrols and provided cover and escort for the bombers. Electronics countermeasures were employed constantly and with great success against enemy gun-laying and searchlight control radars. The amalgamation of these tactical developments represented a satisfactory adaptation of the B-29 air weapon to temporal conditions in Korea: they deterred hostile fighter attacks and rendered the medium bombers less visible to the eyesight of enemy pilots, who, lacking airborne intercept radar, had to see a bomber before they could make an effective firing pass. Here, of course, was the limiting weakness in Bomber Command's tactics: "If they [the Communists] ever crack that last link and get an all-weather capability of pressing an accurate firing attack," predicted General Fisher, "the B-29 business is really going to get rough."<sup>228</sup> The Reds, how-

ever either did not possess an electronics equipped all-weather fighter, or did not choose to employ such an aircraft in Korea, and because of this

providential unreality the old and weary B-29's weathered the crisis of the last year of Korean hostilities.

### AIR DEFENSE OF SOUTH KOREA

**Communist Air Menace to South Korea:** Charged with the air defense of the Far East Command, commander FEAF had at the beginning of Korean operations charged the Fifth Air Force to maintain the air defense of so much of this area as lay within Korea and its adjacent sea frontiers. The commander, Fifth Air Force, thus served also as the commander, Korean Air Defense Region. Easily laid out in mission assignments, the air defense of Korea was more difficult to implement with radar, antiaircraft artillery, and aircraft, with the result that throughout the course of hostilities the Korean air defenses were marginal and represented a never comfortable calculation of the degree of risk attached to the likelihood of Communist air attack.

When the NCAF was easily destroyed in the first weeks of the war, the Fifth Air Force had little initial concern for any danger of hostile air attack in Korea and maintained no formal defense system. But when the CCAF was deployed against the UNC, the Fifth Air Force immediately began to build up its defenses. By the spring of 1952 the Korean air defenses were greatly improved but the Fifth Air Force and other UNC forces in South Korea were admittedly "vulnerable to enemy air attack."<sup>220</sup> Continued augmentations of the Communist air forces, especially the Chinese acquisition of IL-28 jet bombers, brought an increasing awareness of the dangers of air attack and a resultant strengthening of air defenses in the last year of the war.

**Developments in Aircraft Warning Services:** Available to the Fifth Air Force was the 502d Tactical Control Group whose duty it was to provide the communications, control, and warning facilities required to operate air power against the enemy. Subordinate units of the 502d provided the radar and communications network which spanned the entire peninsula. The brain of this network was the Tactical Air Control Center (TACC), operated by the 605th Tactical Control Squadron and located physically adjacent to the Fifth Air Force Joint Operations Center (JOC) in Seoul. Primarily the TACC provided current

aerial information and coordinated the employment of fighter aircraft, antiaircraft units, and all other weapons allocated to the air offense and air defense. Feeding information to and receiving instructions from the TACC in June 1952 were three Tactical Air Direction Centers (TADC's) which were locally capable of performance of air surveillance and identification, directing strikes by electronic means, effecting ground controlled interceptions, and providing navigational assistance to friendly aircraft in distress. Operated by the 606th Aircraft Control and Warning Squadron was the TADC on a 430-foot mountain summit approximately one and a half miles northeast of Kimpo airfield (K-14). The 607th AC&W Squadron maintained another TADC on Kuksa-bong (mountain), approximately 25 miles northeast of Seoul. The third TADC, manned by personnel of the 608th AC&W Squadron, was situated on Hyangbyong-san (mountain), 35 miles northeast of Kangnung in eastern Korea. In addition to the standard CPS-5 heavy weight radars and related equipment in these TADC's, each AC&W Squadron utilized detachments manning light weight (LW) radars, sited where necessary to round out their surveillance. Each AC&W Squadron also possessed a Tactical Air Direction Post (TADP) needed for radar controlled strikes in support of UNC ground troops.\* Providing equivalent air warnings and control services in the southern extremities of Korea were units of the 1st Marine Air Wing: Marine Tactical Air Control Squadron No. 2 operated a TACC at Togudong while Marine GCI Squadron No. 3 ran a TADC at Pochon, both of these stations being in the vicinity of Pohang airfield (K-3) on the southeastern coast of Korea. Marine GCI Squadron No. 1 operated another TADC near Kunsan airfield (K-8) on the southwestern coast of Korea. The Marine electronics establishment also included an early warning station at Cheju and a TADP which customarily occupied a blind-bombing support position to the rear of Marine ground troops on the battle line.<sup>220</sup>

\*See Chap. VI, pp. 222-28.

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Figure 10.

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lation vice the 607th Squadron. A detachment of the 606th Squadron was formed to man the early-warning station at Songgumni.<sup>236</sup>

Reorientation of the surveillance radars of the 502d Group improved the air defense system (see figure 10), and in context with the near completion of the Mark X IFF program the radars gained an ability to identify and continuously track nearly all friendly aircraft over Korea. Small flights of single aircraft and jet fighters, many of which persisted in flying without showing their IFF beacons, nevertheless gave the surveillance system much trouble, but the FEAF order was that all aircraft so equipped would show IFF at all times over Korea. To guarantee further accuracy in friendly recognition, Bomber Command aircraft, many of which were still not provided with Mark X, were required to report their entry and departure from Korea to the TACC. After a conference with the Seventh Fleet, the Fifth Air Force effective on 11 August 1952 also authorized all TADC's and the TACC to enter the naval high frequency liaison net, the purpose being to cross-tell flight information for identification purposes.<sup>237</sup> In August the Fifth Air Force announced that all aircraft proceeding southward which were not identified by electronic means prior to reaching 39° north latitude would be intercepted.<sup>238</sup>

The augmented radar network permitted the Fifth Air Force a positive control over its own aircraft or friendly aircraft while in flight, but there was manifold evidence that the system would be of limited warning value in case of a substantial enemy attack. In view of the speed of hostile jet aircraft, UNC bases in South Korea were physically too close to CCAF bases to allow much time for the friendly radars to flash a warning of an impending attack: if an enemy attack came southward at from 35,000 to 40,000 feet, the 502d Group would be able to provide the Seoul area and nearby fighter bases with not more than about 15 minutes advanced warning. If the enemy came at altitudes above 40,000 feet or under 1,000 feet, it was possible that there would be no advanced radar detection at all.<sup>239</sup> And even if the enemy came at optimum altitudes for radar surveillance there was some doubt that they could be adequately tracked: the heavy radar sets AN/CPS-4 and AN/CPS-5, in use at the major TADC's, were both outmoded and sited primarily for the control of friendly aircraft. Actual "pick up" range for all radars fell

far short of the theoretical range. The AN/CPS-5, for example, sometimes painted targets at 75 miles distance but did not perform consistently: it actually received such poor returns that its prime utility was for the control of friendly aircraft equipped with IFF. And since the IFF was best received in line of sight transmissions, radars were generally sited on high terrain, despite the fact that when positioned too high above immediately surrounding terrain the radars in use did not adequately paint targets not displaying electronic beacons. "The deployment of radar equipment," the 502d Group later observed, "would not have been adequate during the period of hostile activity if the United Nations had not had definite air superiority."<sup>240</sup>

**Antiaircraft Artillery:** To provide local defense against high-flying hostile aircraft the Korean Air Defense Region required antiaircraft artillery gun batteries; for defense against planes attacking at low altitudes it needed antiaircraft artillery batteries equipped with automatic weapons. All antiaircraft artillery battalions were manned and equipped by the U. S. Department of Army, and in Korea such of these units as were not integral parts of ground divisions were subject to the "operational control" of the commander Korean Air Defense Region. Integration of the AAA units into the Korean air defenses nevertheless posed a number of critical problems: precise definition of the "operational control" possessed by the air defense commander over the AAA units was long lacking and the units were continuously deficient in number, trained personnel, and modern equipment.

Whether the air defense commander would have operational control over AAA units, or if he had "operational control" what exact authority would he possess, had been the subject of controversy between the USAF and Army Ground Forces (AGF) in the years between 1946-1950. The AGF held the position that the World War II practice of assigning AAA to Air Force control had resulted in a galling restriction when AAA commanders, charged to defend an area from air attack, were directed to withhold fire by air commanders: the AGF had in 1946 therefore proposed that the air defense mission would be in practice divided with the AAA providing local air defense and the Air Force providing air defense beyond the range of ground weapons. No working agreement on this matter was reached until the Korean

war demanded that the impasse be resolved: on 1 August 1950 a memorandum of agreement between Generals Vandenberg and Collins directed that the air defense commander would exercise operational control over AAA "insofar as engagement and disengagement of fire is concerned."<sup>241</sup>

In accordance with this agreement between the Departments of Army and Air Force, the AAA battalions deployed to Korea were assigned to the Eighth Army, and all nondivisional units were further assigned to the 10th AAA Group. During the early part of the Korean fighting the pertinent FEC operations instructions merely noted that the air defense commander had "operational control" over AAA units, but a 1 March 1952 revision of these instructions specifically defined this "operational control" in such a manner that the air defense commander had no other authority than to announce air raid warning conditions and to prescribe the fire control status.<sup>242</sup> First to point out the defects in such a command arrangement was not the commander Fifth Air Force, who later remarked that the serious weakness in the control structure had imposed no serious hardship because of the "splendid cooperation" of Eighth Army,<sup>243</sup> but it was Col. George B. Carey, commander of the 10th AAA Group. On 7 August 1952 Colonel Carey pointed out that the Korean air defense system was "loose," subject to grave dangers of confusion, and was not designed to achieve maximum results with available resources. Colonel Carey demonstrated that two-thirds of the air defense team—the fighter interceptors and tactical control group—belonged to commander Fifth Air Force, while the other third—nondivisional AAA—"participated in the system only by cooperation and coordination as it has not been allocated or attached to Fifth Air Force as required for essential operational control." Colonel Carey feared that the activation of the Korean Communications Zone,\* which was to relieve the Eighth Army of most responsibilities south of the 37th parallel, was apt to give some difficulty: although the commander Fifth Air Force remained responsible for the air defense

\*On 10 July 1952, CINCFE established the Korean Communications Zone, giving it the authority to control logistical and administration operations in the southern two-thirds of South Korea to the rear of the Eighth Army's combat zone. Establishing a small headquarters at Taegu, the KComZ assumed its duties on 13 August 1952 (See FEC Comd. Rpts., July 1952, pp. 90-91 and Aug. 1952, p. 50).

in both the combat and communications zones in Korea it was not too definite who would command the AAA units in the KComZ. Colonel Carey recommended that all nondivisional AAA units would remain assigned to the Eighth Army but that they would be attached for operational control to the Fifth Air Force as soon as possible.<sup>244</sup>

Although the Fifth Air Force agreed that the control of AAA units constituted in the air defense system a serious weakness which might become especially grave in time of paramount crisis, it made no recommendations on the matter until 5 October 1952, which time appeared opportune since the FEC operations instructions were then being revised. Pointing out the limited control which it possessed over AAA units, the Fifth Air Force then stated that in the event that the tactical situation might require an immediate relocation of AAA units the limitations on its control could seriously affect the accomplishment of the air defense mission. The Fifth Air Force therefore indorsed Colonel Carey's recommendations which had earlier gone forward through Army channels.<sup>245</sup> The Fifth Air Force proposal fell on fallow ground: the Department of Army had just agreed that AAA units would be employed in accordance with the Joint Action Armed Forces paper (JCS 2045/15) which specified that officers assigned to command bases or harbors would be responsible for the local defenses of their commands and would have operational control of all forces other than those of the commander's own service assigned to the base or harbor for defense. In line with this reasoning, CINCFE on 22 January 1953 stated that the "operational control" accorded in its directives to air defense commanders over AAA units would be interpreted according to the approved JCS definition of the term. Air defense commanders, however, were directed to prepare plans for AAA unit deployments in coordination with local Army and Navy commanders and to submit the plans for CINCFE approval prior to their implementation. Conversely, AAA units would not be diverted from air defense to a defense against ground attack without specific concurrence from the air defense commanders.<sup>246</sup> The Fifth Air Force considered that these new definitions conferred adequate control to the air defense commander in Korea.<sup>247</sup>

Similarly satisfactory arrangements were worked out relative to the responsibilities of

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Eighth Army and KComZ to the AAA units. All Army nondivisional AAA units would remain assigned to Eighth Army and attached to the 10th AAA Group. Logistical support for AAA units in southern Korea would, if expedient, be supplied by KComZ, but the commander 10th AAA Group, who also served as AAA advisor to commander Fifth Air Force, would be responsible for all individual and unit training. The over-all mission given to the 10th Group was "to provide AAA defense, under operational control of commanding general Fifth Air Force, for United Nations installations in Korea in accordance with priorities coordinated and recommended by the commanding generals Eighth Army, Fifth Air Force, and KComZ and approved by CINCFE."<sup>248</sup> These instructions did not precisely state which headquarters would issue movement directives or initiate deployment plans, but the Fifth Air Force chose to let the system work without trying to tie it down too exactly.<sup>249</sup>

Although the control of AAA units in Korea thus lacked precise definition during much of the period of hostilities, commander Fifth Air Force, following the spirit of the FEC and FEAF operations instructions which made him air defense commander in Korea, chose to exercise a high degree of initiative and the Eighth Army accorded him complete cooperation, the purpose of both organizations being to secure the maximum defense of the most critical installations with the minimum of available antiaircraft artillery units. During 1951 when the Red air forces were growing and UNC air wings were establishing themselves at Korean bases, the Fifth Air Force had stated the requirement for nine automatic weapons AAA battalions and five gun AAA battalions, but in June 1952 only four of the desired automatic weapons battalions (the 50th, 76th, 865th, and 933d) and only four of the five desired gun battalions (the 68th, 78th, 24th, and the 1st Marine AAA Gun Battalion) were assigned. Although CINCFE repeatedly reminded the JCS that the AAA units in Korea were too few for an adequate defense, the Department of Army was unable to meet stated FEC requirements. Two battalions sent to the Far East late in 1952, moreover, departed the ZI with 75 and 78 percent operational readiness, the Department of Army explaining that the small percentage of trained personnel in

AAA units within the ZI made it difficult to accomplish unprogrammed deployments and still meet extensive overseas replacement requirements.<sup>250</sup>

Following the tactical doctrine that a target which should be defended by AAA should be well defended, the medium battalions, equipped with 90-mm. guns, were stationed to defend the two major ports of Pusan and Inchon and the headquarters installations in Seoul, but the light battalions, equipped with quad mounted .50-caliber machine guns and 40-mm. automatic weapons, had been somewhat more split up, the idea having been at one time that each airfield required a minimum of two automatic weapons batteries, while single platoons of automatic weapons had been posted to Cho-do and Paengnyong-do to protect the radar installations.<sup>251</sup> Seeking a complete and realistic realignment of the scarce AAA units, a conference representing the Fifth Air Force, Eighth Army, and 10th AAA Group met on 25 June 1952 and drew up a list of the priority installations which needed AAA defenses. Only the first 5 of a total of 16 installations could be defended with AAA: namely, Kimpo airfield (K-14), Suwon airfield (K-13), the Pusan complex, Inchon harbor, and Kunsan airfield (K-8). Although the installations were accorded priorities fairly well down the list, the conference agreed that Cho-do and Paengnyong-do were so frequently harassed as to demand that they retain the AAA platoons which were there located.<sup>252</sup>

Subsequently ratified by the commanders concerned, this AAA agreement marked the first time that Korean airfields had been accorded higher priorities than the two major ports. The resultant deployment placed the 68th AAA Gun Battalion and the 865th AAA AW Battalion at Kimpo; the 78th AAA Gun Battalion and the 50th AAA AW Battalion at Suwon; the 1st Marine AAA Gun Battalion and the 24th AAA Gun Battalion at Pusan; the 933d AAA AW Battalion (less the one battery split between Cho-do and Paengnyong-do) at Inchon; and the 76th AAA AW Battalion at Kunsan.<sup>253</sup> This agreement held until October 1952, when the new air base at Osan (K-55), which would soon serve a Sabre wing of the fighter-bomber force, was nearing completion; the Fifth Air Force then requested and secured agreement from Eighth Army and KComZ to accord Osan the third defense priority

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and to locate there the newly arriving 773d AAA Gun Battalion and the 398th AAA AW Battalion. The 398th had been slated to join another battalion new to Korea—the 30th AAA AW Battalion, at Pusan, but there was more pressing need for it at Osan. When this deployment was approved by CINCFE, the 773d took up its station at K-55 in October 1952 and the 398th moved there in January 1953.<sup>254</sup> Because of the intensity of Red air attacks against the radar installations on Cho-do the Fifth Air Force in December 1952 secured permission and moved the platoon of automatic weapons from Paengnyong-do to Cho-do, thus concentrating all of Battery A, 933d AAA AW Battalion on this exposed island position.<sup>255</sup> This deployment of nondivisional AAA units remained in effect until the end of Korean hostilities.

The deployment of AAA units finally effected provided a minimum defense for the 6 highest priority installations out of a total of 17 requiring protection. Actually General Weyland was far from satisfied with the allocation of units even to the highest priority installations: in February 1953 he recommended to CINCFE that three additional AAA AW battalions were needed for station at Kimpo, Suwon, and Osan. At the bases which could not be afforded AAA protection the Fifth Air Force had expected to procure M-55 quad mounts and to get the 10th AAA Group to train USAF personnel to man these weapons, but it soon discovered that it could get only a part of the 52 quad mounts which it required for the purpose.<sup>256</sup> By December 1952, however, two or more quads were located on the airfields at Pusan (K-9), Taegu (K-2), Seoul municipal (K-16), Hoengsong (K-46), Chunchon (K-47), and at the TADC's in central and eastern Korea.<sup>257</sup>

Deficient in number, the AAA AW battalions were also hampered by obsolete weapons. In recognition of the fact that the old type .50 caliber and 40-mm. weapons had low range, low lethality, and inability to engage at night and in bad weather, these weapons were replaced in those AW battalions in the United States between March and October 1953 with new 75-mm. Skysweeper weapons, a radar-directed, automatic-loading weapon which fired 40 to 50 rounds per minute to a vertical height of about 18,600 feet.<sup>258</sup> In an effort to improve the results of the automatic weapons crews, who depended on visual sightings, the Fifth Air Force in December 1952 obtained 19

searchlights, placing 3 on Cho-do and 8 each at K-13 and K-14 airfields. In February 1953, General Weyland also informed CINCFE that the quad .50 caliber machine guns used both by USAF and AAA crews would lack effectiveness against low-flying jet aircraft unless they could be equipped with more modern M-18 reflex sights, which the commander of AFFE stated had already been requisitioned from the Department of Army without results.<sup>259</sup> In May 1953 the Fifth Air Force requested that Skysweepers be obtained for use against the low-flying Red planes which were heckling its forward bases nightly, and FEAF made this requirement known to CINCFE.<sup>260</sup> Neither the additional AW battalions nor the new Skysweeper weapons were obtained for use in Korea before the end of the war.

**Passive Defense Measures:** By November 1952 a considerable effort had been made to improve radar capabilities and to build up the combat readiness of AAA units, but General Barcus was still gravely concerned about the danger of a hostile air attack which, if it came, would obviously be directed against his aircraft and air bases. After reviewing the capabilities of the friendly radar early-warning system, the Fifth Air Force director of intelligence warned that "an initial, uninterrupted strike on the crowded airdromes at Kimpo and Suwon could destroy more than half of the . . . F-86's in Korea."<sup>261</sup> So concerned was General Barcus with this prospect that on 28 November he first issued a plan calling for the redeployment within a month of two Sabre squadrons to the rearward airfield at Pusan (K-1). Such a deployment would reduce the combat efficiency of the two Sabre wings but this was preferable to incurring prohibitive losses in a hostile surprise air attack.<sup>262</sup>

Before this deployment could take place, however, General Barcus stayed the movement of the two squadrons but ordered that the rehabilitation of K-1 airfield would continue and that the 4th and 51st Wings would prepare detailed plans for making such a dispersal on the shortest notice. On 23 January 1953, the Fifth Air Force announced a more comprehensive dispersal plan for the Sabres called "Doorstop": the airfields at K-1, K-2, K-3, K-6, K-8, and K-55 were designated as alternate F-86 bases which were to be provided with servicing and logistical installations required to replenish F-86's on short notice. Daylight alert

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commitments in the 4th and 51st Wings were increased so that 50 percent of combat ready aircraft were to be constantly on standby, readiness, or available status; the combat commitment of the two wings was reduced so that normally not more than 50 percent of combat ready aircraft would be committed to combat at any one time. The two F-86 wings were also ordered to insure that their pilots were qualified to supervise the servicing and arming of their aircraft and that during daylight hours sufficient pilots would be on the line to permit all combat ready aircraft to become airborne within a minimum time (15 minutes desired, 20 minutes maximum). Periodically F-86 flights were to be diverted to the alternate bases for purposes of training. By the end of January 1953 all major items of equipment were either on hand at the alternate airbases or were enroute there, and on 5 February the "Doorstop" plan was formally issued in an operations order which remained effective until 12 April, when the equipping of the 8th and 18th Wings with F-86F's was far enough along so that a new directive was in order. Accordingly the Fifth Air Force then directed the 4th, 8th, 18th, and 51st Wings to maintain the same readiness to deploy to alternate bases, the expanded plan now being renamed "Fast Shuffle." Though subsequent enemy air action never warranted the implementation of either of these dispersal plans, the Sabre wings from time to time diverted squadrons to the alternate bases for purposes of practice, and FEAF regarded them as high priority projects and urged all personnel to expedite and constantly to maintain readiness to execute the dispersal plans.<sup>263</sup>

Concurrently with the implementation of these plans for dispersing the Sabres, the Fifth Air Force brought into being other plans looking toward dispersion and continued operations in the face of an all-out enemy air and ground attack. Plans were kept in readiness for the withdrawal of Fifth Air Force headquarters and subordinate units southward in the event it became necessary to evacuate the Seoul area. The limited capability TADC's at Cho-do and Paengnyong-do were expected to take over if the regular TADC's were knocked out by hostile air attack, and equipment for an alternate TACC was procured and stored at a dispersed point in South Korea. Beginning in February 1953, the Fifth Air Force also moved some eight of its supporting units with

1,000 persons out of the Seoul area and set them up at bases further south.<sup>264</sup>

On 5 January 1953 General Barcus additionally ordered each of his base commanders to "implement every measure both active and passive, consistent with efficient conduct of operations, which will tend to minimize the adverse effects of enemy air activity." He especially desired each commander to take a personal interest to insure that his base defense program was current, realistic, and the best that could be effected within operational limitations.<sup>265</sup> Active air defense measures included such actions as emphasizing minimum time of scramble, and the Fifth Air Force defined and ordered "readiness" and "available" fighter alerts instituted at all Korean bases during dawn and dusk hours.<sup>266</sup> In recognition that passive defense, if overdone, would represent an undesirable diversion of money, materiel, and manhours from primary tactical missions, commanders were urged to effect the principles of passive defense to a reasonable compromise with the tactical situation.<sup>267</sup> Most base commanders built revetments for at least a part of their aircraft, camouflaged their fuel tanks, and provided personnel shelters.<sup>268</sup>

**Korean Air Defenses in Operation:** Except for some changes in terminology which kept pace with similar changes in the United States, the system which the Fifth Air Force employed to meld radar warning, fighter interceptors, and antiaircraft artillery fire in the air defense of Korea was not substantially changed from the organization first effected on 15 November 1951.\* The Korean Air Defense Region, a subdivision of the Far East Command wherein the commander, Fifth Air Force, was responsible for air defense, was divided at 36° 30' north latitude into a Northern Air Defense Area and a Southern Air Defense Area. Each of these areas was further divided into two sectors, the northeast and northwest, the southeast and southwest. Commander, Fifth Air Force additionally commanded the Northern Air Defense Area, using the senior controller on duty at the Seoul TACC as his working representative. Commander, 1st Marine Air Wing was in command of the Southern Air Defense Area. The Fifth Air Force TACC served as the control center for the northern area, and the Marine TACC had equivalent duties in the southern area. Each of

\*See AHS-72, pp. 133-35.

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these control centers maintained continuous liaison with the other, monitored their subordinate TADC's, monitored the fire control status of AAA and issued fire control orders as necessary, diverted aircraft to defense missions as required, and passed identification information. The TADC's, one being responsible in each sector, performed surveillance, filtering, plotting, and identification. The TADC's passed the filtered information to their parent TACC's. They also initiated alert warnings, announced the fire control status of non-divisional AAA units, and managed ground controlled fighter interceptions of unidentified aircraft.<sup>269</sup>

The effectiveness of this defense system was never tested against the major Communist air attack for which it was designed, but from time to time the air defenses were employed against far more aggravating but much less damaging hostile light plane night heckling attacks. During World War II Russian pilots had extensively used small training biplanes, called PO-2's for low-level night sneak attacks in which they glided the little open two-seaters into a target area and dropped a few small bombs. In Korea, North Korean pilots (one of them was reported to be a woman) used these PO-2's and a miscellany of other trainers such as LA-11's and Yak-18's in night heckling work. These planes flew slowly down the moonlit valleys toward the Seoul area, presenting no targets on surveillance radars until they were about 12 miles out, and then circled about until they could pick up a target for an ordnance load which might include converted artillery shells, hand grenades, 3-pound thermite bombs, 55-pound antipersonnel bombs, or 220-pound general purpose bombs. These aircraft could operate from almost any level surface within 165 to 200 miles of their targets, and their slow speeds and poor radar reflecting surfaces (the PO-2 was canvas covered) made them hard to intercept and harder to shoot down. Beginning in June 1951, these heckling attacks continued in sporadic flurries until April 1952.<sup>270</sup>

In the autumn of 1952 the North Koreans again commenced to heckle UNC positions, at first the radar installations on the off-shore islands. In the early morning hours of 13 October, four PO-2's dropped some six bombs on Cho-do and made strafing passes: two Americans were wounded and five Koreans were killed. An F-94 and an F4U

were sent to the area but neither could match the violent evasive actions of the Red light aircraft.<sup>271</sup> The Reds raided Paengnyong-do on the night of 12 November, inflicting no damage.<sup>272</sup> During December 1952 the enemy greatly increased his nuisance raids against Cho-do and began to operate over Seoul, Kimpo, and Inchon, and along the MLR. These December attacks caused negligible damages.<sup>273</sup>

Red air activity was slight until April 1953, when intensified sneak attacks began to give some trouble. At Cho-do low-flying planes attacked in conjunction with artillery shellings from the nearby mainland, which together produced five casualties and some damage to the AAA and radar installations. Several low-flying planes attacked Cho-do on the night of 15 April, killing two AAA gunners and destroying an automatic weapon.<sup>274</sup> Positions along the MLR were bombed on 18 April, and three days later the ROK I Corps was attacked by one or two light planes whose bombs wounded several enlisted men and killed a number of civilians in a nearby village.<sup>275</sup> On the night of 22 April a plane dropped two bombs at K-47 airfield, injuring a Korean civilian.<sup>276</sup> Early on the morning of 23 April a Red PO-2 pilot got over Kimpo to drop bombs and hand grenades and to leave behind five damaged RF-80 aircraft.<sup>277</sup>

After making a few more attacks early in May, the Red night raiders were quiet until the early morning of 27 May when a stream of six or seven light aircraft came down to Kimpo to drop general purpose bombs and converted artillery shells: these munitions slightly damaged two F-80's and one F-86, gutted two supply warehouses, and broke the oil pipeline between Inchon and Yongdungpo.<sup>278</sup> After this beginning, the Red light planes made all-out attacks against the Seoul area during June. On the night of 8 June, nine planes bombed Seoul City: one bomb landed in the street near the press correspondents' billets, breaking several windows and provoking no little newspaper criticism of the inadequacy of the air defenses. On the night of 15/16 June some nine Red aircraft again raided Seoul, shaking President Rhee's mansion with their bombs. On the night of 16 June, four Red planes made the most damaging raid of the war for their side when one of them fired the POL processing and storage dump of the 21st Port Battalion at Inchon, igniting over

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five million gallons of fuel.<sup>270</sup> This most successful attack was also the last successful Red sneak attack because, after 16 June, the UNC air defenses began to score on the hecklers and got the situation back into hand.

Against these Communist nuisance attacks, made by low- and slow-flying light aircraft, the Korean air defenses were not very effective, primarily because these defenses were designed to counteract the immensely more serious air attacks which could have been made by Red high performance aircraft which were poised at the Yalu. The AAA establishment could not effectively deal with these low-level sneak attacks: the altitudes of attack of the light planes were too low to be effectively engaged by the 90-mm. guns, and on the few occasions when these guns were loosed at Kimpo, falling fragments of their projectiles posed a distinct danger to friendly personnel. Because they were dependent upon visual sighting, the automatic weapons were not notably successful against the night raiders, even when the gunners were assisted by searchlights. Automatic weapons fire may have destroyed one Red aircraft over Cho-do on the night of 6 May 1953, although the wreckage of the plane could never be found in the nearby waters.<sup>280</sup>

The Communist light plane attacks also demonstrated a vulnerability in the UNC radar surveillance network: sited on high terrain features, the TADC radars were unable to spot the low-flying Red aircraft as they came down the Korean valleys, shaded by ground echoes. To meet this problem the Fifth Air Force in February 1953 obtained new AN/TPS-1D radar sets which were sited to back up the TADC radars and to cover the valley approaches to vital targets.<sup>281</sup> Procedures were also established whereby ground control approach (GCA) radar sets at K-13, K-14, and K-16 assisted in tracking unidentified aircraft through areas of ground clutter. And for a time AAA acquisition radars were also integrated into the warning network.<sup>282</sup> Even with these expanded radar facilities, however, identification of slow-moving plots as hostile gave no end of difficulty since in forward areas there were many friendly planes operating which did not have Mark X IFF. Army liaison planes and T-6 Mosquitoes, for example, did not have the identification radar, and these planes might be anywhere at any hour of the night. Some help to this problem came in Janu-

ary 1953 when corps fire control centers were tied in with communications to the TADC's and required to file flight plans on all Army aircraft which flew during the hours of darkness.<sup>283</sup>

Although high-performance F3D and F-94 all-weather interceptors occasionally destroyed Red light planes, neither type plane was very good for the purpose. These jets could not throttle down to maneuver with 80-knot Red aircraft, and their airborne radars could not cope with the ground clutter at low altitudes. On the night of 3 May an F-94 got down to 1,000 feet and cut its speed to 110 miles per hour to destroy a PO-2, but this F-94 was lost when it either collided with the Red plane or went into the ground. Thereafter, jet all-weather interceptors were restricted from attempting interceptions of enemy aircraft flying at less than 2,000 feet and slower than 160 miles per hour. Even with this restriction, another F-94, piloted by the 319th Squadron's commander, Lt. Col. Robert V. McHale, was lost on the night of 12 June, shortly after he was given permission to fire on an enemy aircraft at 5,000 feet altitude.<sup>284</sup> In attempts to intercept the Red light planes, a variety of slower-flying aircraft were used. Such planes included LT-6G's equipped with .30-caliber machine guns, which were unsuccessful when there was no illumination (radar blips on GCI scopes merged when the T-6's were a mile away from the enemy aircraft) or when cooperating with flare-dropping transports (the flares merely blinded the T-6 pilots). For these same reasons a B-26 kept at Kimpo achieved no positive results when it tried interceptions.<sup>285</sup>

In the effort to deal with the Red sneak attacks the Fifth Air Force also attempted changes in its air defense control procedures. After the Red air attack on the night of 23 April, the Fifth Air Force decentralized a large amount of the authority previously exercised by the TADC's. The base commanders at Kimpo, Suwon, and Chunchon (K-47) were informed that their bases would be gun defended areas and that they had the authority to declare air raid warning conditions and to place locally deployed automatic weapons on guns-free status. Instructions were issued that no aircraft between last and first light could enter the gun defended areas (defined as below 6,000 feet and within 5 miles radius of the airfield) except when cleared by the local radio control tower after coordination with the base operations and GCA.

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All nontactical flights over Korea were required to file IFR clearances and to keep above 6,500 feet. The Eighth Army was advised that its units could fire on any aircraft flying below 6,500 feet north of a line five miles north of and connecting K-14 and K-18 airfields, except in the K-47 area. VHF check-ins, approach instructions and routes, take-off corridors, and other related control procedures at the gun-defended bases were announced to provide maximum safety for friendly aircraft. The TADC's retained authority to initiate sector air raid warnings, to scramble interceptors and control interceptions, to issue instructions to MATCON when needed to divert nontactical traffic, to issue fire status instructions, and to monitor and if necessary to countermand base fire control instructions.<sup>286</sup>

The revised radar reporting and gun defense system made little appreciable contribution against the Red aircraft which continued to slip undetected and unintercepted into the Seoul-Inchon area. On 16 June, when the Reds made their successful attack against the area, the revised system broke down. On this night, TADC "Watchcase" at Kimpo was receiving surveillance plots from five early warning stations, plus the GCA's at K-14, K-13, and K-6, plus a number of AAA TPS-1D acquisition radars, and it simply could not filter all this information and still perform its primary mission. Control of the fire status in the area became lost: Watchcase, for example, scrambled an AD interceptor at 170100 hours which closed on a bogie over Inchon, only to be subjected to friendly flak at a moment after Watchcase had assured him that Inchon guns were tight; leaving this area and picking up another bogie near the Han River, the AD again pursued toward Inchon, again Watchcase said the Inchon guns would hold fire, but again the AD was fired on; Watchcase then directed the AD to return to K-14, which was supposed to be clear, and to land there, but when the Marine pilot turned on his landing lights over Kimpo he was picked up by searchlights and discovered that a "Red" alert was still on there. Meanwhile, the Fifth Air Force was swamped by telephone calls seeking information on the status of the situation. After this hectic night, the Fifth Air Force on 17 June relieved the base commanders at Kimpo and Suwon of their authority to declare "Red" alerts and to dictate the fire control status for automatic

weapons and returned these duties to the TADC. To cut down on the number of unfiltered plots which had swamped Watchcase, the AAA acquisition radars, which could not distinguish IFF, were removed from the surveillance net and the GCA's were permitted to report only that traffic which entered the restricted areas around their airfields without proper clearance.<sup>287</sup>

These revisions in the control system cleared up confusion, and on 22 June the Fifth Air Force borrowed from Task Force 77 some aircraft and pilots that would be able to handle the slow-flying Red planes. To augment the two Marine AD's currently being used at Kimpo, four F4U5N aircraft and their pilots began operations there on 27/28 June. The Fifth Air Force also made arrangements to get a Firefly fighter from HMS *Ocean* as soon as this plane could be retrofitted with IFF. Navy F4U fighters, however, proved capable of meeting the problem: Lt. Guy Bordon, on detached service from the *Princeton*, intercepted and destroyed two bogies which he identified as Yak-18's in the early morning hours of 30 June and shortly before midnight on 1 July he destroyed two more enemy aircraft which were believed to be either LA-9's or LA-11's.<sup>288\*</sup> After mid-June the Fifth Air Force had also been giving much thought as to where the Communist night hecklers might be coming from: the only ground sightings of PO-2's in recent months had been at Sinuiju and it was obvious that these planes would require staging forward of that base in order to reach Seoul. The most likely staging base for the night hecklers was Pyongyang Main airfield, which had been cratered by the B-29's with 100-pound bombs several times during the spring of 1953 but had been just as persistently repaired. In mid-June this field had a 1,300-foot sod strip and a 2,500-foot concrete strip which were usable. Photo reconnaissance also revealed that several aircraft similar to Yak-18's were dispersed and carefully camouflaged at this airfield.<sup>289</sup> On the night of 3/4 July another B-29 strike, this time employing 500-pound bombs, all but obliterated Pyongyang Main airfield,† and, significantly

\*On the night of 16 July up near Pyongyang, Lieutenant Bordon destroyed a fifth hostile aircraft, said to have been a Yak-18. He thus became the first "Bedecked Charlie Ace," and the first and only U. S. Navy ace of the Korean war (COMNAVFE Command and Historical Report, July 1953, sect. I, pp. 3-4).

†See Chap. IV, 138, 140.

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enough, there were no more "Bedcheck Charlie" heckling attacks against the Seoul area after 4 July 1953.<sup>290</sup>

These Red nuisance raids had been far more troublesome than damaging, but they had demonstrated that air defense systems could not guarantee absolute protection against all types of enemy air attacks and that there was a continued need for dispersed air facilities and for passive defense. Since the standard jet interceptors had been largely ineffective against low-flying enemy aircraft, FEAF thought that such planes might have to be dealt with by AAA defenses, at least until such time as airborne moving target indicator (MTI) was made an integral part of air intercept

radar. Found worthwhile in Korea was the use of light weight radars to watch for low-flying planes and the integration of GCA radars into the aircraft control and warning system. Identification of aircraft had been a problem area: liaison and rotary wing aircraft would need to file flight plans at all times, AAA radars needed a capability to identify IFF signals, and there was a requirement for systematized liaison between TADC's and Air Route Traffic Control Centers in order to reduce unnecessary identification reports. The number of friendly aircraft allowed to operate in a restricted area at any one time required limitation in order that automatic weapons could be given "guns-free" as soon as possible.<sup>291</sup>

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