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**USAF Historical Division**  
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## FOREWORD

*D*uring the period between the close of World War II and the outbreak of the Korean war, the Air Force, in cooperation with the Army, engaged in a series of important air-ground training exercises in the United States, Alaska, and Canada. The history of some of these exercises exists in the form of voluminous final reports; the accounts of other exercises lie buried in a wide variety of sources—in command, numbered air force, and smaller unit histories, and in their supporting documents, as well as in correspondence files in various records repositories. There is lacking, however, any single, comprehensive study of all joint Army-Air Force training exercises for this period.

This monograph sets forth the history of these exercises with particular emphasis on the problems encountered and the lessons learned. For each exercise this study deals with such matters as objectives, participating units, planning, the hypothetical situation, and the actual play of the exercise. These aspects, however, are treated only briefly and as a preliminary to a more detailed examination of the over-all results or findings for each exercise. Emphasis, of course, is placed upon those findings of special interest to the Air Force, upon findings relative to such activities as close-support, airborne, and reconnaissance operations, and upon problems pertaining to communications.

This study is limited to air-ground exercises held in North America. Training exercises conducted in Europe and in Japan have been excluded, as have all joint amphibious exercises.

The study was written by Dr. Ralph D. Bald, Jr. of the USAF Historical Division, Air University, Maxwell AFB, Alabama.

Like other Historical Division studies, this history is subject to revision, and additional information or suggested corrections will be welcomed.

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CHAPTER I

## EXERCISE ASSEMBLY

The first major joint Army-Air Force training exercise held in the continental United States after World War II was Exercise ASSEMBLY. Conducted in the Camp Campbell, Kentucky, area in the spring of 1948 by units of the Army's V Corps in conjunction with units of the Tactical Air Command, Exercise ASSEMBLY was intended to provide training in the planning and execution of joint air-ground operations in an emergency situation.<sup>1</sup>

The major portion of the Air Force participation in ASSEMBLY was provided by units of Tactical Air Command's Ninth Air Force. Since the principal air effort centered around airborne, air-transport, and air-supply operations, extensive troop carrier commitments were required. Troop carrier units assigned to the exercise included the 316th Troop Carrier Wing of the Ninth Air Force, and the Twelfth Air Force's 62d Troop Carrier Wing, which was placed under the control of the Ninth Air Force for the exercise.<sup>2</sup> Fighter support was provided by the 31st and 332d Fighter Wings, the latter assuming the role of Aggressor air.<sup>3</sup> Visual and photo-reconnaissance missions were flown by the 10th Reconnaissance Group,<sup>4</sup> and photo coverage was also provided by the 363d Reconnaissance Group and the 12th Photo Tech Unit.<sup>5</sup> Also taking part were elements of the 72d and 163d Liaison Squadrons, 934th Signal Battalion, Separate (TAC), and 502d Tactical Control Group.<sup>6</sup>

The principal ground force organizations engaged in the exercise were V Corps and the 82d Airborne Division. The 82d Airborne Division units included the 504th and

505th Airborne Infantry Regiments, with the 325th Infantry Regiment attached. Also attached to the division were the 756th and 758th Heavy Tank Battalions.<sup>7</sup>

Planning for Exercise ASSEMBLY was begun by the commanding generals of Third Army and Ninth Air Force early in January, 1948. This preliminary planning was made firm later that month and submitted to Army Ground Forces and Tactical Air Command for approval. On 6 March 1948 authority to commit units of Ninth Air Force to the exercise was received from Tactical Air Command headquarters,<sup>8</sup> and upon receipt of this authority, the A-5 section, Headquarters, Ninth Air Force began formulating its general plan for the maneuver. The culmination of early Ninth Air Force planning was the issuance of the general plan of 23 March 1948, which outlined the hypothetical situation for the exercise and set forth the over-all plan of operations, the missions of Ninth Air Force tactical units, and administrative details.<sup>9</sup>

A later detailed plan, encompassing all aspects of the exercise as they pertained to Ninth Air Force units, was published by headquarters of the Air Task Force (ASSEMBLY) on 15 April 1948.<sup>10</sup> Included in this plan were detailed instructions bearing on troop carrier, fighter, and reconnaissance operations, as well as instructions for operations by liaison aircraft. Also a part of the detailed plan were the intelligence, communications, medical, supply, and maintenance plans for the exercise. It was contemplated that the Air Task Force would establish its headquarters at Greenville

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AFB, South Carolina, with an advance detachment to operate at Smyrna AFB, Tennessee, nearer the exercise area. Troop carrier operations would be conducted from Pope AFB, Fort Bragg, North Carolina; fighter and reconnaissance aircraft, along with gliders and resupply aircraft, would be based at Smyrna AFB. The communications plan called for the 934th Signal Battalion Sep (TAC) to install, maintain, and operate communications facilities at Greenville and Smyrna; a tactical air control center at Smyrna and a tactical air direction center at Franklin, Kentucky, were to be provided by the 502d Tactical Control Group.

In the meantime, Ninth Air Force was kept advised of Army planning. Late in January, 1948, Third Army notified V Corps that it would play a major role in the exercise. Early in March a copy of the Army Ground Forces maneuver directive to Third Army was received by V Corps, and shortly thereafter a small group from Third Army visited V Corps to begin preliminary planning. During the latter part of March, at a conference of Ninth Air Force and V Corps staff personnel, held at Fort Bragg, North Carolina, V Corps outlined tentative plans for the joint headquarters organization that would actually conduct the maneuver.<sup>11</sup> A conference was then held at Third Army headquarters, attended by representatives of Tactical Air Command, Third Army, Ninth Air Force, and V Corps, to clear up points of disagreement before the Third Army plan was published. Early in April staff visits were made to Camp Campbell, Kentucky, the scene of the maneuver, by staff members of the 82d Airborne Division, V Corps, and Ninth Air Force, to fix the locales for small unit training and to examine the terrain for tactical capabilities.<sup>12</sup>

For the conduct of the exercise, the organizational structure provided for in the planning included a Southeastern Theater of Operations, created by Army Field Forces on 20 March, with Lt. Gen. Alvan C. Gillem, Jr., commanding general of Third Army, designated as theater commander. On 25 March, Southeastern Theater activated Headquarters, Joint Task Force Lucky, un-

der the command of V Corps' Maj. Gen. S. L. Irwin, with Maj. Gen. W. D. Old of the Ninth Air Force as deputy commander. The joint task force organization was composed of an air task force, commanded by Brig. Gen. J. V. Crabb,\* deputy commander of the Ninth Air Force, and a ground task force, commanded by Maj. Gen. C. C. Byers, commanding general of the 82d Airborne Division. Within the ground task force, General Byers also commanded V Corps (ASSEMBLY), while its major unit, the 82d Airborne Division, was commanded by the 82d's assistant division commander, Brig. Gen. C. D. W. Canham.<sup>13</sup> The Aggressor force was commanded by Col. Charles C. Sloane, of the Special Projects Branch, Ground General School.<sup>14</sup>

Exercise ASSEMBLY itself was divided into two principal phases. The first phase, a command post exercise, was conducted at Fort Bragg, North Carolina, and Fort Benning, Georgia, during the period 12-21 April. Involving primarily Third Army and Joint Task Force Lucky staff personnel, the purpose of the command post exercise was to provide practice in staff planning and coordination in the conduct of simulated operations against Aggressor guerrillas in the Third Army area.<sup>15</sup>

The second phase of Exercise ASSEMBLY, the field exercise, was held at Camp Campbell, Kentucky, from 8 to 26 May. This second phase was in itself divided into three parts. The first part, continuing from 8 through 12 May, consisted of an airborne landing and attack on Camp Campbell. Following the airborne assault, a series of unit training exercises was conducted. Lasting from 14 to 21 May, these exercises consisted of tactical problems at battalion and regimental combat team level. The concluding portion of the field exercise began on 24 May with a coordinated attack by the 82d Airborne Division and ended with the defeat of the Aggressor on 26 May.<sup>16</sup>

For the play of the maneuver, a hypothetical situation was created to provide a basis for planning and tactical operations. It was assumed, for the purposes of the exercise,

\*On 17 May General Crabb took on the additional duty of deputy commander of Joint Task Force Lucky, replacing General Old.

that an Aggressor nation had gained control of the Caribbean area and had invaded the southeastern United States. This attack had been repulsed and the enemy forces expelled from the country, but small enemy groups which had fought their way through the lines or had been bypassed during the American attack still remained in the Southeast, where, in conjunction with Aggressor sympathizers among the American populace, they were engaged in guerrilla activity against the United States. Maintaining contact with large Aggressor forces in the Caribbean, which were strong enough to attempt another invasion, the Aggressor guerrilla elements constituted a grave threat to American security. Since guerrilla, and fifth-column activities as well, were centered in the Third Army area, that area was designated by the Joint Chiefs of Staff as the Southeastern Theater of Operations. Southeastern Theater then established the Joint Task Force Lucky headquarters as the nucleus of a theater striking force. After the President, on 12 April, declared a state of national emergency, the commanding general of the Southeastern Theater directed Joint Task Force Lucky to take immediate steps to suppress guerrilla activity in the Third Army area. This was the situation that was assumed to have existed on 12 April, when the opening phase of Exercise ASSEMBLY began.<sup>17</sup>

During the command post exercise, after guerrilla activities had been intensified in the Carolinas, Joint Task Force Lucky, on 17 April, was given the mission of capturing or destroying the guerrilla forces. This action was completed on 21 April with the defeat of the guerrillas in the Southern Pines area of North Carolina. For the command post exercise phase a series of situations necessitating action by commanders and staffs were presented; the maneuvering of troops was simulated, and the Air Force took part only to the extent of sending a Ninth Air Force staff officer to Southeastern Theater headquarters to act in an advisory capacity on matters relative to air participation. The field exercise phase, however, involved the actual deployment and maneuver of participating units.

The second phase of ASSEMBLY was based upon a further development of the hypothetical situation that had obtained during the command post exercise phase. Although the guerrilla forces had been defeated in the Southern Pines area, the bulk of these forces had escaped and had captured Campbell AFB, Camp Campbell, Kentucky and were besieging the Camp Campbell Medical Center.

Joint Task Force Lucky was then directed by Southeastern Theater to prepare for an airborne assault against Aggressor forces in the Camp Campbell area. The period 21 April-3 May was used to formulate plans for this assault. On 3 May the commander of the Southeastern Theater directed the joint task force to execute a plan calling for an airborne attack on Camp Campbell for the purpose of recapturing Campbell AFB, relieving the Medical Center, and establishing an airhead as a base for further attacks against the guerrilla forces.<sup>18</sup>

On D-day, 8 May, the 505th Regimental Combat Team (RCT), airdropped by elements of the 316th and 62d Troop Carrier Wings, captured Campbell AFB. The following day, troops of the 504th RCT were airdropped at Campbell AFB, and on D plus 3 the 325th RCT arrived at Camp Campbell by motor from Fort Benning. After the capture of the air base on D-day, these units were employed in expanding the airhead westward to a restraining line running generally north and south along Indian Mound Road.\* This mission was accomplished by 12 May, D plus 4, thus concluding the first part of the field exercise phase of Exercise ASSEMBLY.<sup>19</sup>

During the period when unit training was being conducted, 14-21 May, the guerrillas had succeeded in capturing an airfield in the vicinity of Paris, Tennessee, southwest of Camp Campbell, and had been reinforced by regular Aggressor troops flown in from the enemy's Caribbean bases. However, friendly air, by preventing aerial resupply and reinforcement of these Aggressor elements, isolated them in the Paris area. Thereupon, the Aggressor launched an at-

\*See Appendix 1



tack aimed at the recapture of Camp Campbell. Joint Task Force Lucky was then directed to prepare for an attack aimed at the destruction of the Aggressor force. On 24 May the final part of the field exercise phase began, with the 82d Airborne Division, supported by the Air Task Force, launching its drive on the Aggressor. On 26 May, having been forced into a pocket near the Cumberland River, the Aggressor forces surrendered, thus concluding Exercise ASSEMBLY.<sup>20</sup>

Throughout the play of Exercise ASSEMBLY, the Air Task Force assumed a prominent role. During the opening phase, 8-12 May, its troop carrier units, employing approximately 75 C-82's and 24 CG-15 gliders, flew 244 sorties, which included dropping of troops, glider landings with reinforcements of personnel and equipment, glider evacuation of wounded, and arlanding of troops and supplies.<sup>21</sup> Friendly fighters (24 P-51's), during the entire course of the exercise, 8-26 May, flew 421 sorties, providing cover for troop carriers and strafing and dive bombing in close support of ground operations.<sup>22</sup> Reconnaissance units, with 9 F-6's\* doing most of the work, flew 224 sorties and furnished photo and visual reconnaissance of the Camp Campbell area and armed reconnaissance for the movement of land elements of the 82d Airborne Division. Aggressor fighters (8 P-47's) flew 110 sorties, bombing and strafing ground troops.<sup>23</sup> Vital control facilities for air-ground operations during the exercise were provided by a detachment of the 502d Tactical Control Group, which established a tactical air control center (TACC) at Smyrna AFB, a tactical air direction center (TADC) at Franklin, Kentucky, and two tactical air control parties (TACP) for operations in the exercise area.<sup>24</sup>

In assessing the results of Exercise ASSEMBLY, both its accomplishments and its shortcomings must be considered. In general, this joint exercise provided valuable training in modern methods of air-ground warfare for approximately 30,000 troops. So far as Ninth Air Force was concerned, the exercise furnished worthwhile unit training

for Air Force personnel, while at the same time it demonstrated to inexperienced ground force personnel the role of tactical air power in the air-ground combat team.<sup>25</sup> With regard to staff organization and procedures, the joint air-ground staff team within the Joint Task Force Lucky headquarters provided participating officers experience in the functioning of a single integrated staff.<sup>26</sup>

A clearer picture of the results of Exercise ASSEMBLY emerges if an examination is made of certain specific activities which for the Air Force units constituted the major portion of the maneuver. These activities fall into two broad categories—troop carrier operations and air-ground operations, with the latter involving such other activities as reconnaissance and communications.

Following the exercise, general satisfaction with the conduct of troop carrier operations was expressed by representatives of air and ground alike. Col. Adriel N. Williams, commanding officer of the 62d Troop Carrier Group, called the exercise the most successful training exercise in which he had ever participated.<sup>27</sup> Lt. Gen. Alvan C. Gillem, Jr., Southeastern Theater commander, stated that the airdrop had been well executed, that reinforcement by air had been precisely timed and efficiently conducted, and that the performance of the troop carrier units indicated a high degree of individual and unit training. The entire airborne operation, said General Gillem, "reflected most favorably on the Air Force components."<sup>28</sup>

Despite this praise for the conduct of troop carrier operations during ASSEMBLY, there were, nevertheless, certain criticisms. Deficiencies were noted and recommendations were made for their correction. Headquarters, Air Task Force believed that the exercise demonstrated the need for troop carrier standing operating procedures and recommended that such procedures be drawn up, published, and distributed to the air and ground units concerned.<sup>29</sup> A similar recommendation was made by the A-3, Ninth Air Force, who, while witnessing the exercise, noted especially deficiencies in

\*The F-6 was the reconnaissance version of the P-51

take-off procedure for troop carrier aircraft, and deficiencies also in the procedure for the dropping of paratroops. Because of faulty take-off procedure aircraft frequently had to fly in prop wash immediately after take-off. In the dropping of paratroops, element leaders were allowed to rely entirely on their own judgment to determine when to discharge their passengers over the drop zone, and as a result some drops were inaccurate. What was needed, it seemed, was a standardized procedure that would lessen the chances for error resulting from the exercise of individual judgment.<sup>30</sup> To correct these deficiencies, Ninth Air Force, in June 1949, published Training Guide 120-1: Standing Operating Procedure for Troop Carrier-Airborne Operations.<sup>31</sup>

A further assessment of the troop carrier phase of Exercise ASSEMBLY was made by the 82d Airborne Division staff. Its report on the exercise praised the "complete cooperation" of troop carrier units; at the same time it was felt that the drop zone at Camp Campbell had been too small for the airdrop of a regimental combat team. The 82d Airborne Division staff believed that a larger drop zone would have given observers a more realistic concept of the speed and control that could and should be attained in the initial phase of an airborne operation.<sup>32</sup> In addition, the commander of the 82d Airborne Division voiced certain criticisms of the C-82 aircraft. In his opinion, experience during the exercise had proved that the C-82 monorail was impractical as a device for discharging cargo, and he urged that either the C-82 monorail be perfected and made more reliable or that some other means of discharging tonnage be developed. He believed also that the C-82 could be made a more comfortable aircraft for the paratroopers by installing sliding doors, which could be readily opened as the drop zone was approached.<sup>33</sup>

Hardly less important than troop carrier operations was the close support furnished by the Air Force during all phases of Exercise ASSEMBLY. That this support was effective is evident from the remarks made at the conclusion of the exercise by Maj. Gen.

S. L. Irwin. Air participation, said General Irwin, had been of "incalculable value" to the ground forces. He believed that the effect on the troops had been on the whole excellent, since the exercise demonstrated to them the "facility with which ground troops can get air support."<sup>34</sup>

There is evidence, however, that air-ground operations during the exercise were not completely satisfactory. Paradoxically, a criticism that was frequently made was that the Air Force furnished too much close support. Although he praised Air Force close support, General Irwin also observed that the quantity of support provided was greater than that which could be assured in an actual operation and that the troops may have been "oversold" on air support, thus gaining an unrealistic picture of what could be expected in actual combat.<sup>35</sup> Also commenting on the excessive quantity of close support, Brig. Gen. J. V. Crabb declared that this condition led on the one hand to ground force hesitancy to use the support available, lest an unrealistic impression be created, and on the other hand to the employment of air against inappropriate targets, such as dispersed infantry.<sup>36</sup>

A somewhat different version of this problem, and one which offers a reason for the oversupply of tactical air, appears in the Joint Task Force Lucky Final Report. According to this report, the opening phase of the field exercise, the airborne assault, had revealed a general lack of knowledge by ground troops of techniques and capabilities of tactical aircraft in close support of ground elements. To correct this deficiency, an overabundant quantity of close support was provided during the unit training period which followed, in the expectation that ground troops would thus learn more rapidly the proper methods of requesting and employing tactical air. A decided improvement in this regard was noticeable during the final phase of the field exercise, an improvement which, it was believed, justified the provision of excessive close support during the unit-training exercises.<sup>37</sup>

Criticism of the lack of reality in the exercise was reflected also in other portions of the Joint Task Force Lucky Final Report,

particularly in part of the J-3 report.\* It was claimed that since the Air Task Force in this exercise supported only one division rather than the several it would normally support, and that since the distance separating the Air Task Force base and the division it was supporting was considerably less than the normal distance, problems of communication and staff coordination were oversimplified, thus making it difficult adequately to test prevailing air-ground doctrine.<sup>38</sup>

Although this point may have been well taken, other comments regarding air-ground operations contained in the J-3 report indicate either a lack of concern for existing doctrine or a misunderstanding of its principles. Comment regarding the joint operations center (JOC) is a case in point. According to Field Manual 31-35, Air-Ground Operations, the JOC is established at tactical air force-field army level. In this report, however, it was recommended that JOC's be set up at corps and even at division level in order to avoid what the report termed the "unsound tendency" to centralize heavily at the tactical air force-field army JOC. The JOC's at corps and division, said the report, "must be the agencies charged with planning for and directing the employment of aircraft allocated to their particular units." It was asserted also that targets in a division area should be no concern of the JOC at tactical air force-field army level unless those targets were of special interest to the field army or tactical air force commander. It was "imperative," the report claimed, that the day-by-day, routine cooperation of Air Force units in the immediate battle areas of corps and divisions "be decentralized to these corps and divisions."<sup>39</sup>

What was being advocated here, it would seem, was a modification of tactical air doctrine in order to permit ground units to exercise a degree of control over tactical air. Further evidence that such control was being sought is found in the claim made in the J-3 report that the air liaison officer assigned to the infantry division "should be

empowered to employ aircraft working with the division as the division commander desires, without the necessity of clearing with the Joint Operations Center for the purpose of changing targets, missions, etc." The employment of air with the division, the report declared, "must be decided at division level."<sup>40</sup> Recommendations of this nature, it should be pointed out, were in direct opposition to dominant Air Force thinking; if acted upon, the result would be to jeopardize such fundamental principles of tactical air power as mobility, flexibility, and the concentration of force.

An additional aspect of air-ground operations during Exercise ASSEMBLY receiving a share of criticism was the employment of tactical air control parties (TACP). General Crabb was of the opinion that these control parties had, on certain occasions, been improperly utilized, a misuse that had resulted, he believed, partly from the inexperience of the controllers themselves and partly from ignorance of their proper employment on the part of ground personnel.<sup>41</sup> Further criticism appeared in the J-3 report, which stated that experience gained during ASSEMBLY had proved the need for assigning additional TACP's to infantry divisions, and it was suggested that four control parties per division was a minimum requirement. Such a provision, it was felt, would make possible safe and effective bombing within the bomb line.<sup>42</sup> The 82d Airborne Division also noted deficiencies in the performance of the TACP's during the exercise. These parties, it was observed, had experienced difficulty in keeping up with the infantry in the attack. It was pointed out also that the AN/VRC-1 radio used by the TACP's was apparently too fragile for satisfactory operation with infantry attacking over rough terrain or terrain lacking good observation posts.<sup>43</sup>

Communications, always a vital part of air-ground operations, appear to have been reasonably effective. Aside from the 82d Airborne Division comment cited above, the chief complaint pertaining to communications was voiced by General Crabb during the exercise critique. Stressing the need for good communications, he stated that defi-

\*The J-3 of Joint Task Force Lucky was a ground officer, and the comments made in this report appear to reflect a ground viewpoint.

ciencies in this regard during ASSEMBLY emphasized the importance of joint planning on the entire communications plan. Such planning, he believed, would have made unnecessary the changing of radio frequencies that caused delay at certain stages of the exercise. General Crabb also observed that the exercise demonstrated the need for more adequate field testing of new communications equipment and the need also for mobile, flexible equipment that could function despite heavy enemy attack.<sup>44</sup>

Photo reconnaissance also received a share of attention following the exercise. The 15th Tactical Reconnaissance Squadron of the 10th Reconnaissance Group flew most of the photo coverage required for the exercise. The training received was considered particularly valuable to this squadron and valuable also to the group as a whole.<sup>45</sup> However, from the remarks made by General Crabb at the maneuver critique, it is apparent that photo coverage during the exercise had not been entirely adequate. General Crabb made no reference to specific deficiencies, stating merely that the experience gained in ASSEMBLY would enable the Air Force to achieve much better results in the future in providing photographic information to the fighting forces on the ground.<sup>46</sup> The comments of V Corps (ASSEMBLY), on the other hand, were much more specific. Its report stated that because of lack of coordination in planning for photo coverage, pinpoint photos were inaccurately located, front cover was generally received too late to be useful, and photos were sometimes sent to interpreters without a plot or pilot's trace.<sup>47</sup>

Further criticism of photo coverage provided during ASSEMBLY was forthcoming from the 12th Photo Tech Unit, which was responsible for the printing and processing of aerial photos and for the laying of mo-

saics. Early in the exercise this unit was assigned the mission of processing photos which were to furnish basic coverage of the Camp Campbell Military Reservation. On 8 April, the 363d Reconnaissance Group attempted to fly a series of overlapping reconnaissance strips of an area 10 miles wide and 50 miles long, covering the Camp Campbell Military Reservation from east to west. However, neither the reconnaissance group nor the 12th Photo Tech Unit was provided adequate maps of the area, and as a result plots could not be made to determine whether or not the area had been completely covered. It was necessary to print each reconnaissance strip in order to ascertain that the strips properly overlapped; approximately 3,000 prints were laid out before it was learned that coverage was unsatisfactory, and there was no alternative but to fly the entire mission over again and to repeat the process until all gaps were covered. It was pointed out also by the 12th Photo Tech Unit that it had not been included among the organizations originally scheduled for participation in ASSEMBLY, and that as a consequence no priority for obtaining or replacing materials was received until 27 May, the day after the close of the exercise.<sup>48</sup>

In the opinion of the 12th Photo Tech Unit, poor coordination between the Ninth Air Force A-3 officer and the unit, and the failure of Ninth Air Force to furnish the unit with necessary information concerning its participation in the exercise, had resulted in a waste of effort and materials. It was claimed also that "training gained was negligible." The unit did not, however, confine itself entirely to negative criticism; to correct the deficiencies reported, it recommended that a qualified photographic officer be assigned to the Ninth Air Force A-3 section to coordinate photographic requirements.<sup>49</sup>

## CHAPTER II

## EXERCISE TARHEEL

As a sequel to ASSEMBLY, the Army and the Air Force in the spring of 1949 joined forces in conducting Exercise TARHEEL. On the Army side, this exercise, like its predecessor, was under the over-all control of Third Army. Tactical Air Command, which had been reduced from major command status by the Air Force reorganization of December 1948, was made responsible for planning and for immediate supervision of tactical air operations during the exercise, but over-all control of Air Force participation was vested in Continental Air Command.<sup>1</sup> Held in the Fort Bragg-Camp Mackall area of North Carolina, the purpose of TARHEEL was to train Army and Air Force units in field operations and air-ground operations under simulated combat conditions, and to indoctrinate personnel of both services in techniques and procedures incident to such operations.<sup>2</sup>

Principal Air Force units taking part in the exercise were the 316th Troop Carrier Group, the 20th Fighter Group, the 363d Tactical Reconnaissance Group, the 86th Bombardment Squadron, the 502d Tactical Control Group, and the 934th Signal Battalion. Also participating were the Air National Guard's 156th and 157th Fighter Squadrons and one squadron of the 82d Fighter Group, the latter acting as Aggressor air.<sup>3</sup> The major ground force unit engaged was the 82d Airborne Division, supported by the 44th, 73d, and 758th Heavy Tank Battalions and the 98th Field Artillery Battalion. The Aggressor ground force was composed of the 3d Armored Cavalry Regiment and one battalion of the 82d Air-

borne Division's 505th Airborne Infantry Regiment.<sup>4</sup>

Planning for Exercise TARHEEL began with a conference at Fort Bragg, North Carolina, on 15 December 1948 between representatives of Third Army, Tactical Air Command, V Corps, and the 82d Airborne Division. During this conference spokesmen for Tactical Air Command stated that because of other commitments, the Air Force would be unable to participate in the exercise.<sup>5</sup> However, at the second planning conference, held at Fort Bragg on 11 February 1949, representatives of Tactical Air Command indicated that the Air Force would take part. It was agreed that since it was too late to begin planning for the employment of a joint task force similar to that organized for Exercise ASSEMBLY, the Air Force would provide a separate task force to support the ground task force.<sup>6</sup>

The scope of Air Force participation was further defined at a third planning conference at Fort Bragg, held on 30 March 1949 by spokesmen for Tactical Air Command, Third Army, and V Corps. At this time the Air Force troop list was presented, and it was decided that Air Force units would be placed under the command of an air task force, coequal with the ground task force.<sup>7</sup> The final conference relative to Air Force participation in TARHEEL was conducted at Fort Bragg on 30 March 1949, with representatives of V Corps, Tactical Air Command, 934th Signal Battalion, 502d Tactical Control Group, and Exercise Director headquarters in attendance. At this meeting the arrival dates of the various Air

Force units at Camp Mackall were fixed, allocation of buildings and bivouac areas to Air Force units was made firm, and the V Corps engineer officer agreed to lease lands for use by Air Force tactical air direction centers. In addition, the final Air Force troop list was presented.<sup>8</sup>

Under the command organization provided for the exercise, Lt. Gen. Alvan C. Gillem, Jr., Third Army commander, was placed in control of the entire Army operation. Representing General Gillem as Army exercise director was the commanding general of V Corps, Lt. Gen. John R. Hodge. In addition, General Hodge was designated as commander of the ground task force, Task Force Victor.<sup>9</sup> In command of the entire air operation was Maj. Gen. Robert M. Lee, commander of Tactical Air Command. The air task force, Task Force Eagle, was commanded by Maj. Gen. Glenn O. Barcus of Twelfth Air Force. General Barcus also performed the functions of air exercise director and commander of the Aggressor air forces.<sup>10</sup>

It should be noted that the organizational structure for TARHEEL differed considerably from that employed in ASSEMBLY.<sup>11</sup> For TARHEEL no joint task force was established, coordination of the air-ground effort was accomplished at the Task Force Eagle-Task Force Victor level of command by means of the JOC located adjacent to the two task force headquarters at Camp Mackall.<sup>12</sup>

During the exercise the 316th Troop Carrier Group and the 86th Bombardment Squadron were based at Greenville AFB, South Carolina. The 20th Fighter Group operated from Shaw AFB, Sumter, South Carolina, the 363d Tactical Reconnaissance Group from Langley AFB, Virginia, the 156th Fighter Squadron (ANG) from Morris Air Base, Charlotte, North Carolina, and the 157th Fighter Squadron (ANG) from Congaree Air Base, Columbia, South Carolina. The 95th Fighter Squadron, representing Aggressor air, was based at Pope AFB, Fort Bragg.<sup>13</sup>

Exercise TARHEEL was conducted in two phases, a unit training phase and a field exercise phase. For Army units, the unit

training phase, beginning on 21 April and continuing until 11 May, consisted of battalion and regimental combat team exercises.<sup>14</sup> During the period 20-30 April, Air Force units engaged in pre-exercise training which included thorough schooling of officers and key enlisted personnel in the provisions of FM 31-35, preplanned interdiction missions for fighter pilots and light bombardment crews, and pinpoint photo missions for reconnaissance crews. Following this training, Air Force units were deployed in the maneuver area, where from 5 to 11 May they engaged in small joint exercises with units of the ground task force. During these exercises close support activity was emphasized in order to provide intensive training for forward air controllers.<sup>15</sup>

For the ensuing field exercise part of Exercise TARHEEL a hypothetical situation was created as a vehicle for the play of the maneuver. To provide continuity, this situation was based upon the situation that had existed at the conclusion of Exercise ASSEMBLY.\* It was assumed that since the defeat of the Aggressor guerrilla forces during ASSEMBLY by Joint Task Force Lucky, the Aggressor had been building bases in the Caribbean from which he could launch an airborne attack on the United States. Intelligence reports indicated that several guerrilla leaders had escaped capture at Camp Campbell and were organizing forces in the vicinity of Fort Bragg, North Carolina, to reinforce the Aggressor in the event of an airborne landing in that area. The possibility of such an airborne attack was strengthened by reconnaissance of the Caribbean area which revealed Aggressor preparations for an assault on the southeastern United States.<sup>16</sup>

To counter this threat, the Joint Chiefs of Staff directed the formation of Task Force Victor and of Task Force Eagle to support its operations. Task Force Victor was assembled at Fort Bragg early in April 1949; Task Force Eagle Headquarters moved to Camp Mackall, near Fort Bragg, on 28 April, and the two task forces engaged in

\*See above, pp 3-4

unit and joint training in preparation for a possible Aggressor attack.<sup>17</sup>

On 11 May, as training activity was being concluded, word was received that Aggressor airborne troops had landed just north of Fort Bragg and were overrunning Pope AFB. The Task Force Victor commander was directed to attack as soon as possible to destroy the Aggressor and to secure the Fort Bragg-Camp Mackall area against further Aggressor operations. On the air side, the commanding general of Task Force Eagle was directed to support the Task Force Victor attack.<sup>18</sup>

It was against this background that the play of the TARHEEL field exercise was conducted. This phase began late in the evening on 11 May, when notice of the Aggressor attack was received by Task Force Victor. Reconnaissance by the 82d Airborne Division's reconnaissance company fixed the position of the Aggressor at the high ground approximately 15 miles due west of the Fort Bragg building area.\* The reconnaissance elements were followed closely by the 82d's 505th and 325th Airborne Infantry Regiments, with supporting artillery and armor, and early on 12 May a battle developed for possession of this high ground. This terrain was captured on 13 May, and continued pressure on 14 and 15 May pushed the Aggressor eastward to the center of the Fort Bragg Military Reservation.<sup>19</sup>

On the evening of 16 May, after a 24-hour non-tactical period, allowed for rest and rehabilitation of men and equipment, friendly forces attacked again to gain a line of departure for a coordinated assault planned for the following morning. This assault was launched at 0630 hours on 17 May with the airdrop on Drop Zone Sicily of the 504th Airborne Infantry RCT, whose mission it was to disrupt enemy communications and to seize the high ground at Holiday Hill and Polly Ray Hill, approximately eight miles due west of Fort Bragg proper.† By nightfall the airborne force had accomplished its mission and had linked up with land elements of Task Force Victor,

attacking eastward in the direction of the airhead. On the morning of 18 May, after the airborne units had been resupplied by air, the attack was resumed; penetrations were made all along the Aggressor line, and by 1330 hours the Aggressor forces were split into two parts, immediately west of the Fort Bragg cantonment area. At this point, the Aggressor forces surrendered, thus concluding Exercise TARHEEL.

The role of the Air Force in TARHEEL differed somewhat from its role in ASSEMBLY. In ASSEMBLY the principal activity had centered around the establishment and maintenance of an airhead, and the Air Force role, particularly troop carrier participation, was crucial; in TARHEEL, on the other hand, the Air Force's role was a subordinate one, devoted to support of what was largely a ground force effort.

Despite its subordinate place in the concept of the exercise, Air Force participation was by no means minor; the support rendered the ground elements was extensive, and it was an essential part of the conduct of the maneuver. The 316th Troop Carrier Group, reinforced by elements of the 62d and the 314th Troop Carrier Groups, provided the airlift for the vertical envelopment carried out by the 82d Airborne Division's 504th Airborne Infantry RCT. On D-day for the drop, 17 May, C-82 aircraft flew 57 sorties, dropping 1,354 troops and 192,899 pounds of supplies. C-15A gliders flew 32 sorties, airlifting 64,000 pounds of personnel and equipment, and on D plus 1, C-82's in 12 sorties dropped 48,000 pounds of supplies during the resupply operation.<sup>20</sup>

Of special importance, during both the training and field exercise phases, was the support given by Air Force fighter units. During the period of the exercise, the 20th Fighter Group and the ANG's 156th and 157th Fighter Squadrons flew a total of 529 sorties, performing close-support armed-reconnaissance, and escort missions, and providing cover for the troop carrier operation.<sup>21</sup> In addition, 339 sorties were flown by the 95th Fighter Squadron in support of the Aggressor forces.<sup>22</sup> The 20th Fighter Group was equipped with F-84B's, the 156th Fighter Squadron with F-47's and the

\*See App 2  
†See App 2

157th and 95th Fighter Squadrons with F-51's.\*

Also taking a prominent part were the 47th Bombardment Group and the 363d Tactical Reconnaissance Group. During the period 5-18 May, the 47th Group's 86th Squadron, employing B-26's, flew 174 sorties, including Shoran sorties, Norden bombing sorties, low-level visual bombing, rocket firing, and strafing.<sup>23</sup> The 363d Tactical Reconnaissance Group's RF-80's and RB-26's flew 334 sorties, chiefly in furnishing visual and photo reconnaissance.<sup>†24</sup>

Significant also was the work of the 502d Tactical Control Group in establishing and operating the tactical air control system for the exercise. The principal elements for the system were a TACC, located at Camp MacKall, a TADC at Condor, North Carolina, a light-weight radar at Pope AFB, and four TACP's which worked with the ground units. The group also furnished a three-station D/F net, FM relay stations, and a general messenger service.<sup>25</sup> In addition, communications facilities were provided by the 934th Signal Battalion.<sup>26</sup>

As to the results of Exercise TARHEEL, comments made during the critique indicated general satisfaction with the over-all success of the maneuver and with the performance of Air Force units. Colonel Lynch of the Army Field Forces training section stated that the realism injected into the exercise had made it the nearest thing to war conditions he had seen since May 1945. TARHEEL, he said, had "far surpassed last year's Exercise ASSEMBLY." Colonel Lynch was particularly impressed with the effectiveness of the air support, which he believed had materialized to the "complete satisfaction" of everyone concerned.<sup>27</sup> A similar view was expressed by Colonel Maddox, G-3 of Third Army, who praised the air task force staff, unit commanders,

and aircraft crews for their "wholehearted enthusiasm and complete cooperation" in carrying out their missions. Colonel Maddox noted especially the "superb quality" and the large quantity of air support furnished during the maneuver.<sup>28</sup> General Hodge was of the opinion that the Air Force had done a "superior job" throughout the exercise.<sup>29</sup>

However, as General Lee of Tactical Air Command observed at the conclusion of the exercise, in order to gain maximum benefit from Air Force-Army training exercises, it is necessary for the participants to take stock of the lessons learned, to correct deficiencies, and to improve techniques and equipment employed in air-ground operations.<sup>30</sup> It is important, then, to examine the shortcomings, as well as the accomplishments, of the exercise.

Always a key feature of joint Army-Air Force training, air-ground operations were subjected to special scrutiny following Exercise TARHEEL. Unlike Exercise ASSEMBLY, which emphasized troop carrier operations, TARHEEL was, in the main, concerned with a ground force advance overland, and the major part of the Air Force effort was directed toward aiding that advance. Noting the high quality of the close support furnished the ground troops, General Byers, commander of the 82d Airborne Division, called this support the "most outstanding" he had ever seen. The general found especially gratifying the promptness with which air strikes were executed following ground force requests. As an example he pointed to one case in which fighters based at Shaw AFB hit a target in the maneuver area in less than 30 minutes after the request for air support was initiated. And once again, as had been the case during Exercise ASSEMBLY, the quantity of close support exceeded what would normally be available in combat, with the air effort in support of the 82d Airborne being in excess of what would normally be furnished an army corps.<sup>31</sup>

Despite the high quality and generous quantity of close-support provided, mistakes were made and much was learned. Effective close support operations require a high de-

\*The F-51's were the same type aircraft as the P-51's referred to in Chapter I, and the F-47's were the same as the P-47's. On 1 July 1948 the "P" designation for fighter aircraft was changed to "F." At the same time the FP-80 reconnaissance aircraft was redesignated as the RF-80. In this study the designations "P" and "FP" are used in the discussion of those exercises that took place before 1 July 1948 (Exercises ASSEMBLY, YUKON, SNOWDROP, TIMBERLINE, and MESQUITE). In the treatment of exercises held after that date (Exercises TARHEEL, SWARMER, and SWEETBRIAR), the new designations are used.

†Because of a shortage of jet aircraft, the 363d Tactical Reconnaissance Group's RF-80's were also used as fighters and fighter-bombers.



gree of coordination between the components of the air-ground team, and there were occasions during the exercise when difficulties which prevented the smooth functioning of that team cropped up. It is important to examine these deficiencies and, where possible, to indicate the suggestions made for their correction.

Participating fighter units, for example, had considerable difficulty identifying ground targets, particularly tanks and vehicles. To alleviate this problem, it was recommended that targets be clearly designated by means of smoke and that panels be used to distinguish friendly tanks and vehicles from those of the enemy.<sup>32</sup> These suggestions, of course, involved no innovation; what was advocated was rather a return to practices tested and proved during World War II.

Close support was also hampered, at least so far as one fighter unit was concerned, by the failure of Air Task Force Eagle to furnish an accurate, up-to-date bomb line. Lacking information as to the location of the bomb line, each flight leader had to carry a complete set of coordinate maps and attempt to locate enemy positions by coordinates given by ground controllers, a difficulty that would not have arisen had a bomb line been furnished daily.<sup>33</sup>

As had been the case in Exercise ASSEMBLY, there was some dissatisfaction with the performance of the forward air controllers (FAC). The 157th Fighter Squadron considered the work of the controllers "entirely inadequate." Specific criticisms were that quite often controllers could not be contacted, that even when contacted, controllers could rarely furnish pilots with a ground target, and that controllers seemed unable to work with more than one flight at a time.<sup>34</sup> On the other hand, the 20th Fighter Group, the major fighter unit engaged in the exercise, found that although control of aircraft during the early days of the exercise had been poor, there was steady improvement as the maneuver progressed.<sup>35</sup>

An important development in the matter of aircraft control was the use, during TARHEEL, of FAC's who jumped with the air-

borne troops. This technique was not new, having been tried with some success in the Normandy jump during World War II. Its use again in this training exercise is indicative of the effort being made to improve close support during airborne operations. On 17 May two FAC's, carrying air-ground radios, jumped with each of the two parachute battalions. Meanwhile, a tactical air coordinator in a B-26 was circling in the vicinity of the drop zone. Seven minutes after the first controllers were dropped, they were in radio contact with the tactical air coordinator and were summoning fighter aircraft for air strikes on the Aggressor.<sup>36</sup>

A significant innovation in Exercise TARHEEL was the employment of an infantry division fire support coordination center (FSCC), a facility designed to provide a single location in which all communications incident to the control of artillery, air support, and naval gunfire are centralized, thus providing for coordination of fire support. Actually, one of the purposes of Exercise TARHEEL was to test the adequacy of the FSCC as a device for facilitating the coordination of air-ground activities.<sup>37</sup> In this exercise the senior TACP, equipped with AN/VRC-1 and AN/TRC-7 radios, was stationed at the FSCC. Flights performing close-support missions were assigned directly to this TACP, which would in turn assign them to other TACP's, located at the battalion command posts, for final control.<sup>38</sup> During the course of the exercise, various types of close-support missions were flown, testing the technique of integrating all types of fire support.<sup>39</sup> The FSCC functioned so successfully that the commanding general of the 82d Airborne Division recommended that it be adopted by the Department of the Army.<sup>40</sup> The Air Force viewpoint was that although the stationing of the senior TACP at the FSCC had been successful, this procedure should not be accepted as Air Force doctrine until further testing had been accomplished.<sup>41</sup>

<sup>36</sup>The Joint Training Directive for Air-Ground Operations, 1 September 1950, amplifying and revising FM 31-35, Air-Ground Operations, deals with the functioning of the FSCC. However, the placing of a TACP at the FSCC, as first tested in TARHEEL, is not called for. Instead, an air liaison officer is located at the FSCC and is charged with the supervision of TACP's operating with the infantry division.

One of the most notable aspects of Exercise TARHEEL was the opportunity it provided for testing the capabilities of jet aircraft. Based on the experience gained during the exercise, a number of important conclusions were drawn. It was learned, for example, that despite its high speed the jet can be controlled without undue difficulty by the TACC, the TADC, and the TACP's during close-support, interdiction, and interception missions.<sup>42</sup> Moreover, the performance of jet aircraft in TARHEEL had seemingly furnished proof to the ground forces that the jet was as effective in close support work as the propeller-driven aircraft.<sup>43</sup> General Barcus believed that the jets (F-84's and RF-80's) had performed creditably. He claimed that the argument that the jet was too fast for effective close support was not a valid one, that in light of the improvement of ground forces automatic weapons, the need was for more, rather than less, speed.<sup>44</sup>

Despite these favorable comments, there are indications that the performance of the jets was not completely satisfactory. It was found that the F-84's and RF-80's, because of high fuel consumption, were "severely handicapped" by a lack of endurance at low altitudes. Consequently, they could not remain over the target area long enough for thorough area searching for targets of opportunity. Endurance was sufficient, however, for pre-planned missions.<sup>45</sup> Another aspect of the fuel situation was that the large amount of fuel required by a jet unit operating at maximum effort made it necessary to overwork personnel and equipment in servicing units.<sup>46</sup> An additional criticism of jet performance was that the aircraft's extremely wide radius of turn made the pinpointing of ground targets especially difficult.<sup>47</sup>

The method of employing light bombardment aircraft in TARHEEL was also held up to scrutiny following the exercise. Commenting on the results of the maneuver, the 86th Bomb Squadron, flying B-26's, found that many of the low-level targets assigned to the squadron were unsuitable for the tactical bomber in that these targets could not be visually identified in time to open fire

effectively. It was found that the only alternative was to pre-select prominent landmarks, to fly over them on a pre-determined heading, and to open fire at a pre-determined time. The experience of the exercise, it was concluded, emphasized the requirement that in assigning low-level targets, consideration should be given to the problem of identification at high speeds and low altitudes.<sup>48</sup> A further comment regarding the problem of targets was made by General Barcus, who was of the opinion that the maneuver area had provided too few targets suitable for interdiction work by light bombardment aircraft. He felt, however, that by sending these aircraft outside the maneuver area to attack simulated targets, valuable training had been provided for the light bomber crews.<sup>49</sup>

Other difficulties experienced by the 86th Bombardment Squadron stemmed from the fact that the number of sorties flown per day was more than double the number called for in the air general plan. Thus, an absolute maximum load was imposed not only on that squadron but also on its parent organization, the 47th Bombardment Group. The result was that only a short interval could be allowed between the return of one mission and the dispatching of the next, and interrogation and briefing had to be cut to the barest essentials. Moreover, the high sortie rate did not permit the performance of major aircraft inspections at the maneuver base; the last few hours before an inspection was due had to be used to return the aircraft to their home station, and recently inspected aircraft had to be sent as replacements. It seemed imperative to this unit that in order to plan an efficient maintenance and supply program, units participating in maneuvers should be given, as early as possible, an accurate estimate of the sortie rate.<sup>50</sup>

Also a problem for this unit was the computation of Shoran data. During the course of TARHEEL, the 86th Bombardment Squadron flew a total of 58 Shoran sorties. The air general plan for the exercise provided that computations for Shoran operations were to be furnished by the topocomputation section of the 1st Shoran Beacon

Unit, located in the vicinity of the JOC.<sup>54</sup> At some point during the exercise, however, the task of computing Shoran data was passed, without prior notice, to the 86th Bombardment Squadron. This was a task with which the unit was unfamiliar and for which it was unprepared, and the result was to decrease the effectiveness of Shoran missions flown by the squadron.<sup>52</sup>

Although Shoran missions performed by the 86th Bombardment Squadron and the 162d Reconnaissance Squadron, Night Photo were in the main satisfactory, Exercise TARHEEL revealed definite weaknesses, badly in need of correction. Inadequately trained personnel and general lack of interest in Shoran operations within these squadrons and within the 1st Shoran Beacon Unit created difficulties which even an intensive training program prior to TARHEEL could not completely overcome. Following the exercise, it was recommended that the commanding officer of the 1st Shoran Beacon Unit be replaced by an officer possessing proper technical qualifications and that the 47th Bombardment Group and the 162d Reconnaissance squadron be required to carry out a continuous training program, with Shoran missions as part of their normal operations. It was recommended also that the Shoran beacon unit be assigned directly to a numbered air force and that it be manned by experienced surveyor and geodetic computer personnel.<sup>53</sup> In addition, it was suggested that in order to increase the effectiveness of Shoran during joint operations, a Shoran liaison officer be assigned to the task force headquarters and that he be made responsible to the combat operations officer at the JOC, where he would furnish technical advice and help coordinate all matters pertaining to Shoran activities.<sup>54</sup>

Troop carrier operations in TARHEEL, as has been pointed out, were on a smaller scale than in Exercise ASSEMBLY. Apparently, these operations were carried out successfully and with a minimum of difficulty. The airdrop and resupply missions of 17 and 18 May were conducted according to plan,<sup>55</sup> and the report of the 316th Troop Carrier Group makes no reference to problems en-

countered during these missions.<sup>56</sup> General Barcus also seemed well satisfied with the results of troop carrier operations and, in the critique, made special reference to the "valuable training" afforded all who had taken part in them.<sup>57</sup> Contributing to the smoothness of these operations was the decision to assign a competent troop carrier officer to the JOC during the maneuver, where his experience could be brought to bear on troop carrier problems.<sup>58</sup>

The only criticism of TARHEEL by the 316th Troop Carrier Group was that because of limited housing and messing facilities at Camp Mackall, the airlift base, the group was required to limit the number of personnel taking part in the exercise. Many who could have received worthwhile training were thus unable to take an active part. Therefore, it was recommended that in future maneuvers the entire troop carrier group, with its supporting units from the wing, be required either to move into the field or to simulate field conditions at its home station. If this were done, all personnel could benefit from training that could be experienced only under field conditions.<sup>59</sup>

An important part of the Air Force contribution to Exercise TARHEEL was the furnishing of visual and photo reconnaissance by the RF-80's and RB-26's of the 363d Tactical Reconnaissance Group. With regard to photo reconnaissance, a special problem was posed by the fact that this unit was expected to operate from its home station, Langley AFB, Virginia, approximately 200 miles from the exercise area, a distance which, under combat conditions, would have made the prompt processing and delivery of aerial photos virtually impossible. This problem was partially solved by moving a skeleton laboratory crew to Camp Mackall and by basing some RF-80's at Shaw AFB, South Carolina.<sup>60</sup> This arrangement helped speed up the delivery of photos. In the average time of 2 hours and 28 minutes from the time over target RB-26's were able to land at the Camp Mackall airstrip and deliver their photos to the laboratory crew for processing.<sup>61</sup> The RF-80's, however, could not land at the

Mackall airstrip, but had to return to Shaw; the film was then flown to Mackall for processing, and this time-consuming procedure delayed the delivery of photos to the using units.<sup>62</sup>

The 363d Tactical Reconnaissance Group, as a result of its experience in TARHEEL, learned also that the T/O&E allotments for its squadron S-2 sections were not large enough when the squadrons were heavily committed, as they were in this exercise. The group found it necessary to "beef up" these sections in order to maintain speed and accuracy in briefing and debriefing pilots.<sup>63</sup>

Probably the most severe criticism of the exercise, so far as the 363d Tactical Reconnaissance Group was concerned, was one which related to the employment, or rather what it considered to be the misemployment, of the group's aircraft during the maneuver. The RF-80's were used not only for reconnaissance but also for close-support and armed-reconnaissance missions, missions for which this aircraft was not equipped and for which the pilots were not trained.<sup>64</sup> Similarly the group's RB-26's, unarmed and relatively slow, and equipped only for night photo work, were required to fly daylight photographic missions. It was recommended by the 363d Tactical Reconnaissance Group that in future maneuvers the RB-26's and RF-80's be used only for the purposes for which they are suited.<sup>65</sup>

In spite of these difficulties, it was believed that the group benefited greatly from

<sup>62</sup>The necessity for using RF-80's for these missions stemmed from the inability of the 20th Fighter Group to maintain its F-84's and also from the requirement that fighter cover be furnished over the maneuver area eight to ten hours each day. The use, or misuse, of the RF-80's was decided upon to relieve the overburdened 20th Fighter Group (Hq TAC. Comments on Air TF Eagle by Col E K Warburton, Actg Vice Comdr. Air TF Eagle, 23 July 1949, in Hist 12th AF, 1 Dec 1948-31 Dec 1949, Vol IV, doc 799.)

its participation in the exercise. This was true not only of the aircrews but also of those engaged in intelligence and operations staff work. TARHEEL, it was concluded, had molded the group into a smoothly functioning unit; it had boosted morale and had increased the group's combat efficiency.<sup>66</sup>

In addition to observations concerning close support, light bombardment, troop carrier, and reconnaissance activity, there were relative to the results of the maneuver certain miscellaneous comments that also deserve attention. The 157th Fighter Squadron, for example, believed that the exercise demonstrated the need for a simplified system of maps for fighter aircraft. It was suggested that a definite area be assigned each squadron for a given mission, an area that would require only a small number of large-scale maps and one small-scale map for unexpected deviations in targets. This procedure, it was pointed out, had been used quite successfully for close support by the Ninth Air Force in World War II.<sup>67</sup>

With regard to intelligence work during the exercise, the 86th Bombardment Squadron found that data received by the squadron was not sufficiently detailed or exact to enable it to keep accurate situation or flak maps.<sup>68</sup> The director of operational intelligence for the air task force reported that the majority of the officers and airmen assigned to the intelligence section of the task force headquarters had had no previous experience in operational intelligence procedure and that the exercise had therefore provided especially valuable training in intelligence techniques so necessary to effective air-ground operations.<sup>69</sup>

## CHAPTER III

## EXERCISE SWARMER

The dust from Exercise TARHEEL had hardly settled at Fort Bragg, when the Air Force began looking ahead to Exercise SWARMER, a large-scale joint Air Force-Army training exercise to be conducted in the Fort Bragg area in the spring of 1950.<sup>1</sup> Although it was originally named TARHEEL II, Exercise SWARMER was much more similar in concept to ASSEMBLY, held in the spring of 1948, than to TARHEEL I. In Exercise ASSEMBLY, it will be recalled, the major Air Force effort centered around the establishment and maintenance of an airhead. Although it was similar in concept to ASSEMBLY, Exercise SWARMER was much larger in scope. Whereas during ASSEMBLY one regimental combat team had been airdropped, SWARMER involved the airdrop of three regimental combat teams and the airlanding of two others. Including also, as it did, the large-scale aerial resupply of this force, SWARMER took on the proportions of a strategic airlift unprecedented in a peacetime maneuver.<sup>2</sup>

The principal Air Force units committed to SWARMER were the 314th Troop Carrier Wing, the 20th Fighter-Bomber Wing, the 4th Fighter-Interceptor Wing, and the 363d Tactical Reconnaissance Group.<sup>3</sup> Also participating were one squadron of the 62d Troop Carrier Wing, the 161st Tactical Reconnaissance Squadron, Photo-Jet, the 82d Fighter-Interceptor Squadron, the 2d Fighter All Weather Squadron, and the 156th and 157th Fighter Squadrons (ANG). The air effort was further augmented by elements of the Navy's Carrier Air Group 2 and Marine Transport Group

153. So extensive were the airlift requirements for the exercise that the Military Air Transport Service (MATS) and the Air Force Reserve were called upon for heavy commitments, the former for air transport units to be used for airlanding of troops in the airhead and for resupply operations and the latter for troop carrier units to be employed chiefly in the airlift of units and equipment to and from the maneuver area before and after the exercise.\* Providing control, communications, and photo-processing facilities were the 502d Tactical Control Group, a Shoran beacon unit, and the 363d Reconnaissance Technical Squadron.<sup>4</sup>

The major Army units assigned to SWARMER were the 11th and 82d Airborne Divisions, with the 11th furnishing the 187th and 511th Regimental Combat Teams, and the 82d providing the 504th, 505th, and 325th Regimental Combat Teams. Taking part also were numerous supporting units of these divisions and certain staff members of the 3d Infantry Division.<sup>5</sup>

Playing the role of the Aggressor during SWARMER was the 15th Infantry Regiment, supported by armor, artillery, and combat engineers. Acting as the Aggressor air force was the 31st Fighter-Bomber Group, with the 82d Fighter-Interceptor

\*MATS was represented by 11 air transport squadrons drawn from the 1600th, 1600th, 1700th, and 1703d Air Transport Groups and from the 1701st Air Transport Wing (Exercise SWARMER Troop List, in Final Rpt. Exercise SWARMER, Apr-May 1950, pp. 203-04). The Air Force Reserve furnished aircraft and crews from the 375th, 419th, 433th, 434th, 436th, 437th, 441st, 512th, and 518th Troop Carrier Wings (Ltr Hq TAC to CG ConAC, sub Reserve Troop Carrier Units for Exercise SWARMER, 9 Feb 1950, in H1st TAC, 1 Jan-30 June 1950, III, doc. 321).

Squadron attached.\*<sup>6</sup> Also included in the Aggressor air force were the 162d Tactical Reconnaissance Squadron, Night Photo<sup>7</sup> and night fighters of the Navy's Composite Squadron 4<sup>8</sup>

The formulation of detailed plans for Exercise SWARMER devolved principally upon Tactical Air Force (Provisional) [TAF (Prov.)], Tactical Air Command's field operational headquarters for exercises conducted under the over-all jurisdiction of Continental Air Command. On 10 December 1949 the Department of the Army and the Department of the Air Force issued the original directive for the exercise.<sup>9</sup> On 15 December members of the office of the deputy for plans and requirements of TAF (Prov.) visited the headquarters location of SWARMER at Fort Bragg to establish liaison with exercise headquarters. The period to 25 January 1950 was used to request augmentation personnel for TAF (Prov.) and to select from its permanent staff a planning cadre for the exercise. On 25 January approximately two-thirds of the personnel of TAF (Prov.) left Pope AFB to participate in Exercise PORTREX, the big Caribbean amphibious maneuver held in February and March 1950. TAF (Prov.) personnel who remained behind composed the nucleus of the planning staff for SWARMER.<sup>10</sup>

The initial draft copies of the general plan issued by Headquarters, Maneuver Commander (MANCOM) were received by TAF (Prov.) on 6 February. On the same day a briefing was held by MANCOM and the information gained at this briefing, along with the material contained in the draft of the general plan, made it possible to estimate the nature and scope of the mission of TAF (Prov.) for the exercise. Work was then begun on TAF (Prov.) Operation Plan 3-50, which was published in draft form on 13 March. Initial briefing on this draft was held at Pope AFB on 27 March for some 200 representatives of participating units. Following this meeting,

\*On 26 April 1950, two days before D-Day for the exercise, the 31st Fighter-Bomber Group's commitment to Aggressor air was reduced to one squadron, and the other squadrons of the group, including the attached 32d Fighter-Interceptor Squadron, were reassigned to the United States forces (31st Ftr-Bomber Gp, Final Rpt Operation SWARMER, May 1950, in Hist 31st Ftr-Bomber Gp, 1 Apr-30 June 1950, sup. docs)

final construction of TAF (Prov.) Operation Plan 3-50 was undertaken by the planning staff. Early in April, shortly before the exercise opened, a second briefing was held at Pope to present the latest information relative to planning and organization for the maneuver.<sup>11</sup>

Joint planning for SWARMER began with conferences conducted from 9 to 13 January at Third Army headquarters, Fort McPherson, Georgia, and at MANCOM headquarters, Fort Bragg, North Carolina. Planning was based on the joint Army-Air Force directive of 10 December 1949. Discussion at this conference centered around the proposed general plan of MANCOM headquarters. The problem of maneuver control was explored, and the general and special situations for the exercise were prepared.<sup>12</sup> During a second joint planning conference, held at Fort Bragg, 13 to 16 February, matters of troop lists, communications, and logistics were considered.<sup>13</sup>

The organizational structure established during the planning phase provided for an over-all MANCOM headquarters, with the exercise itself to be conducted by Task Force Swarmer, which in turn was to be composed of V Corps on the Army side and Air Task Force Swarmer on the Air Force side. Because of commitments to Exercise PORTREX and elsewhere, it was impossible to man separate headquarters for both MANCOM and Task Force Swarmer. The solution decided upon was that the MANCOM staff, a joint staff, would also function as the staff for Task Force Swarmer.<sup>14</sup>

Administrative support for Army units taking part in the exercise was to be furnished by Third Army, and for Air Force units by Fourteenth Air Force. For logistical support of the airlift the Carolina Base Section was established. Composed chiefly of Army Transportation Corps personnel, this section was to operate through four aerial ports of embarkation and debarkation in and near the maneuver area.<sup>15</sup>

Air Task Force Swarmer was composed of a Tactical Air Force (TAF), a Tactical Bomber Force (TBF), and an Air Transport Force. The principal units of TAF were the 20th Fighter-Bomber Wing, the 4th Fighter-

Interceptor Wing, the 161st Tactical Reconnaissance Squadron, Carrier Air Group 2 (Navy), the 502d Tactical Control Group, and the 934th Signal Battalion, TBF, which was placed under the operational control of TAF, was made up of the 84th and 85th Bombardment Squadrons (L) Jet.\* The Air Transport Force was composed of the Strategic Air Transport Division and the Troop Carrier Division. Within the Strategic Air Transport Division were the 8th Troop Carrier Squadron and two strategic air transport groups, composed chiefly of MATS units, while the Troop Carrier Division included the 314th and 316th Troop Carrier Groups and Marine Transport Group 153.<sup>16</sup>

During the exercise, Task Force Swarmer headquarters was located at Camp Mackall. Air Task Force Swarmer and V Corps headquarters were established at Outer Camp Mackall, as were the headquarters of two of the components of the Air Task Force—TAF and Air Transport Force. The third component, TBF, operated from Langley AFB, Virginia. The Air Transport Force's Troop Carrier Division conducted operations from headquarters at Maxton Airfield, North Carolina, and its Strategic Air Transport Division from headquarters at Greenville AFB, South Carolina. Aggressor headquarters was located at Fort Bragg.

An indication of the importance of the Air Force role in Exercise SWARMER was the appointment of Lt. Gen. Lauris Norstad (USAF) as maneuver commander. Task Force Swarmer was commanded by Lt. Gen. John R. Hodge (USA). Maj. Gen. P. W. Clarkson (USA) headed V Corps, and Brig. Gen. W. R. Wolfenbarger (USAF) was in command of Air Task Force Swarmer. Leading the Aggressor forces was Maj. Gen.

Robert M. Lee (USAF), and Brig. Gen. Paul F. Yount (USA) commanded the Carolina Base Section.<sup>17</sup>

Air Task Force Swarmer participation in the maneuver was conducted in three phases. The opening phase, beginning 14 April and continuing through 21 April, was devoted to unit training. Phase two, the assault, during which combat operations were initiated, began on 21 April and extended to D-day, 28 April, a period during which air-superiority and interdiction missions were run in preparation for the airdrop on D-day. During the final phase, termed the development of the objective, D-day through D plus 5, TAF and TBF were engaged largely in furnishing close tactical air support required by the ground troops for consolidation and expansion of the airhead. At the same time, during the final phase the Air Transport Force, supported by TAF and TBF, was occupied in airdropping and airlanding of troops and in maintaining a strategic airlift to supply the forces in the airhead.<sup>18</sup>

For Air Task Force Swarmer's opposite number, V Corps, the phases of the exercise were not so clearly defined. The period 18-27 April was devoted chiefly to completion of planning and to air transportability training, with combat operations beginning on D-day and continuing through D plus 5.<sup>19</sup>

In the hypothetical situation set forth to provide background for the play of the maneuver, it was assumed that the United States was at war with an Aggressor whose forces, early in February 1950, had seized the Florida peninsula. On 10 March the Aggressor took Wilmington, North Carolina, while at the same time enemy airborne forces secured the Fort Bragg-Camp Mackall-Fayetteville area farther inland. To counter these moves by the Aggressor, the Southeastern Theater of Operations (SET) was established and assigned the primary task of containing the Aggressor in the Florida peninsula, with the ultimate objective being the expulsion of the enemy from American soil. Following the Aggressor penetration of North Carolina, SET activated Task Force Swarmer for the purpose of mounting an airborne operation to free

\*For SWARMER, TAF and TBF units were equipped with the following numbers and types of aircraft:

20th Fighter-Bomber Wing	84 F-84D's
4th Fighter-Interceptor Wing	73 F-86A's
161st Tactical Reconnaissance Squadron	18 RF-80's
Carrier Air Group 2 (Navy)	99 F4U-4's and AD-4's
2d Fighter All Weather Squadron	5 F-82's
84th and 85th Bombardment Squadrons (L) Jet	32 B-45's
Aggressor air employed the following numbers and types of aircraft:	
31st Fighter-Bomber Group	47 F-84E's
82d Fighter-Interceptor Squadron (On D minus 2, Aggressor jet fighter strength was reduced to 23 F-84E's)	19 F-84D's
162 Tactical Reconnaissance Squadron	16 B-26's and RB-26's
Composite Squadron 4 (Navy)	9 F4U-4's; 3 AD-2's, 1 P2V

the Fort Bragg-Camp Mackall-Fayetteville area and to destroy the Aggressor forces in the Wilmington area.<sup>20</sup>

In order to accomplish these objectives, it was planned first to seize the Fort Bragg-Camp Mackall-Fayetteville area, an area which would provide airfields for a further build-up of United States forces. Camp Mackall, located immediately southwest of the Fort Bragg Military Reservation, was chosen as the point of initial attack. D-day was set at 28 April. During the week prior to D-day, TAF and TBF had been engaged in gaining air superiority and interdicting the battle area in preparation for the airborne assault. The first drop was made on the morning of 28 April in the vicinity of Camp Mackall (Drop Zone Luzon) by the 187th RCT of the 11th Airborne Division.\* By 1300 hours the airfield at Camp Mackall had been secured and the perimeter of the airhead extended sufficiently to allow the airlanding of 11th Airborne's 511th RCT, which was airlifted from Camp Campbell, Kentucky. At 1600 hours on D-day the 505th RCT of the 82d Airborne Division dropped in the northwestern corner of the Fort Bragg reservation (Drop Zone Holland), and then advanced southwest to assist the 11th Airborne in securing the causeways leading to the Fort Bragg reservation. The 504th RCT of the 82d Airborne was airlanded at Camp Mackall at 1730 hours and quickly crossed the causeways to the Bragg reservation †<sup>21</sup>

The following morning, on D plus 1, contact was made between the 505th RCT and elements of the 11th Airborne Division, and by late afternoon all entrances to the western part of the Bragg reservation, and road junctions in the immediate vicinity, had been secured. Early on D plus 2 the 325th RCT of the 82d Airborne Division was dropped in the center of the Bragg reservation (Drop Zone Sicily) †† behind the Aggressor lines, forcing him to withdraw, and by afternoon the 82d Airborne, attack-

ing to the east, had secured Pope AFB, adjacent to Fort Bragg itself. The next two days, D plus 3 and 4, were spent consolidating positions and preparing for a V Corps attack to the southeast, to seize the final objective, Fayetteville Airfield. Early on the morning of D plus 5, the two airborne divisions jumped off and by 1000 hours reached the eastern limits of the Bragg reservation, at which point the exercise was concluded.

Some appreciation of the scope of Air Force participation in SWARMER may be gained from the fact that during combat operations, 21 April-3 May, TAF and TBF (under TAF's operational control) flew a total of 3,344 sorties in air-defense, counter-air, interdiction, reconnaissance, and close-support missions.<sup>22</sup> From 28 April, D-day, through 3 May, 237 aircraft of the Air Transport Force made 2,230 "trips" while airdropping and airlanding 20,851 troops, 15,842 tons of supplies, and 3,098 vehicles and weapons in the airhead.<sup>23</sup> It should be noted that from D-day until the conclusion of the maneuver, SWARMER was plagued by bad flying weather. From D plus 2 through D plus 5 approximately 400 sorties were flown by TAF, but during this same period well over 1,000 sorties were canceled because of bad flying weather.<sup>24</sup> However, bad weather apparently did not interfere seriously with transport operations. On D plus 2 and D plus 5 weather conditions made it necessary to increase the interval between aircraft from the usual three minutes to five minutes, and on D plus 3, at the Mackall airstrip, the combination of bad weather and an aircraft accident which tore up the lighting system forced the suspension of all operations for two and one half hours. Otherwise, transport operations were unimpeded by the weather.<sup>25</sup>

It is evident from the remarks made at the critique of Exercise SWARMER that despite the lack of precedent for an exercise of this size and concept, SWARMER, by and large, had been successful. General Hodge, Task Force Swarmer commander, in his comments, pointed not only to the "spirit of cooperative effort" that characterized the maneuver but also to certain speci-

\*See Appendix 3

†The land between Camp Mackall and the Fort Bragg Military Reservation is privately owned property and was not available for use by maneuvering troops because of the prohibitive cost of lease rights. In the SWARMER maneuver plan this land was designated as swampland and the roads leading into the Fort Bragg reservation were termed causeways.

††See Appendix 5



fic accomplishments. He stated that the exercise had demonstrated the ability of the armed forces to airlift and airdrop heavy equipment, to make mass tactical parachute jumps, and to conduct ground operations after seizure of an airhead. For the first time in a training exercise, he declared, all these elements had been joined together in one unified effort.<sup>26</sup>

General Wolfenbarger selected as the high point of the exercise from the air point of view, the integration of troop carrier and strategic air transport elements into a single air transport force. SWARMER had demonstrated to his "complete satisfaction" that troop carrier and air transport concepts were capable of successful combination.<sup>27</sup> As for tactical air operations, General Clarkson, who had commanded V Corps during the exercise, pointed out that tactical air support had been available far in excess of what a corps could normally expect in combat and that front-line troops were "loud in their praise of the prompt, heavy support provided throughout the problem."<sup>28</sup>

An exercise of the size and scope of SWARMER, based on a concept largely without precedent, was bound to reveal a wide variety of deficiencies and problems. Since SWARMER involved the airborne seizure of an airhead and maintenance and expansion of that airhead by troops, equipment, and supplies flown in by airlift, the Air Force role during the exercise was crucial. In view of the novelty of such an operation and its immense possibilities for future development, it is especially important to take stock of the lessons learned in this maneuver. The limitation of space precludes an examination of findings in minute detail, but it is possible to analyze the major results.

It is proposed first to examine certain aspects of the Air Transport Force operations. As has been indicated, this force was composed of the Troop Carrier Division and the Strategic Air Transport Division. The Troop Carrier Division, staffed by personnel of the 314th Troop Carrier Wing, furnished the airlift for the major portion of the airborne

assault and was engaged also to the full extent of its capabilities in resupply operations. During the exercise the Troop Carrier Division dropped 5,606 paratroopers and 369 tons of equipment and supplies. In addition, 8,753 passengers and 2,500 tons of cargo were landed in the SWARMER airhead.<sup>29</sup>

The airdrop of the 187th, 505th, and 325th Regimental Combat Teams by aircraft under the operational control of the 316th Troop Carrier Group was evidently accomplished without notable incident, although in the drop of the 325th RCT on D plus 2, rain and low clouds made it necessary for several serials to deviate from pre-planned run-in courses and make two passes over the drop zone.<sup>30</sup>

Even though all airdrop missions were successfully carried out, there are indications that the airborne assault was not well planned; indeed, this phase of the exercise appears to have succeeded in spite of poor planning rather than because of sound planning. Although Air Task Force headquarters repeatedly advocated the calling of a joint planning conference between representatives of the Airborne Force and Troop Carrier Division, such a conference was never held.<sup>31</sup> Chief emphasis in planning seems to have been placed not upon delivery of the airborne forces for the initial assault on the airhead but upon the strategic airlift that was to follow.<sup>32</sup> The Air Transport Force, which controlled both the strategic airlift and troop carrier operations, did not consult the Troop Carrier Division or hold any conferences between troop carrier and airborne personnel for the purpose of planning the airborne assault on D-day. As a result of this lack of coordination, the operation order which arrived at Troop Carrier Division headquarters on D minus 3 contained so many errors that the D-day assault could not be carried out without major changes in this plan, changes which continued until a few hours before the take-off for the attack. It seems obvious that this situation, which might have seriously affected the success of the operation, could have been avoided if there had been proper coordination and liaison

between the airborne, troop carrier, and air transport forces.\*<sup>33</sup>

Planning deficiencies at the higher level were bound to affect operations at the lower levels. The 316th Troop Carrier Group found that lack of detailed information concerning the airborne assault phase made it impossible to formulate plans until a few days before D-day, that briefings were delayed until shortly before the execution of each mission, and that the assignment of tasks to subordinate units had to be delayed accordingly.<sup>34</sup>

Another important criticism made by the 316th Troop Carrier Group, a criticism which may have stemmed from planning deficiencies, was that specific limitations on aircraft loads for paratroop missions were not adhered to by airborne units, thus creating a safety problem. As a corrective measure, it was recommended that load limitations be specified in detail by the Air Force commander concerned and that these limitations be strictly complied with.<sup>35</sup>

Comments on airdrop operations during SWARMER were not, however, confined to adverse criticism. Training exercises under simulated combat conditions are a test not only of men and methods but also of equipment. Exercise SWARMER, for example, was the first real test of the C-119 for tactical suitability, and valuable lessons were learned. Two years earlier, after Exercise ASSEMBLY, serious doubts had been raised concerning the effectiveness of the C-82 monorail as a device for discharging cargo.† Exercise SWARMER demonstrated that the C-119 monorail was a distinct improvement over that of the C-82; more than 300,000 pounds of equipment and supplies were dropped using the C-119 monorail, without a malfunction. The cargo floor of the C-119 proved to be the aircraft's only major weakness. Heavy vehicles and the failure to use a sufficient number of load spreaders caused damage to the floors of a number of aircraft. The recommended solution to this problem was that the floor of the C-119 be strengthened; the use of more load

spreaders, it was believed, would only add to the aircraft's already numerous pieces of equipment without solving the basic difficulty.<sup>36</sup>

Also participating in the exercise were the older C-82's.†† For the first time while in mass formation, C-82's with the clam-shell doors removed dropped heavy equipment. The drops were highly successful; and every item of heavy equipment, including artillery pieces, which made up the major portion of the 280,000 pounds dropped by this method, was put into action shortly after it landed.<sup>37</sup>

In summing up the results of the maneuver, the commanding officer of the 314th Troop Carrier Wing commented that SWARMER had provided a more realistic and thorough test for his unit than any of the past exercises in which it had participated, and that increased individual and unit proficiency gained from this exercise had definitely raised the combat effectiveness of the wing.<sup>38</sup>

SWARMER was, of course, an important exercise from the troop carrier standpoint. However, troop carrier operations in this exercise, except perhaps for the mass dropping and airlanding of troops, were not unique. The support of an independent airhead by strategic airlift, on the other hand, was largely a new departure, a new concept. The independent airhead, as conceived in SWARMER, presupposed two conditions: 1) that the airhead be established in enemy held territory in an area where enemy ground troops possessed the capability of seriously interfering with the operation, and 2) that the airhead be entirely supported by air.<sup>39</sup> This support was to be provided by a strategic airlift—that is, by the continuous or sustained mass movement by air of personnel, supplies, and equipment into the airhead.

Before assessing the results of the airlift, some attention must be given the organization established to conduct it. It was pointed out earlier in this chapter that the logistical support organization created for

\*A possible explanation for this confusion lies in the fact that Headquarters, Air Transport Force did not enter the exercise until a late date (Operations SWARMER and the 314th TC Wg (Foreword), May 1950)  
†See above p 5

††Approximately 70 troop carrier aircraft were employed in the drops of personnel, supplies, and equipment. An approximately equal number of C-82's and C-119's composed this total.

SWARMER was the Carolina Base Section (CBS). An Army organization, composed largely of personnel from New York Port of Embarkation transportation port companies, CBS established aerial ports of embarkation at Greenville AFB, South Carolina, and Maxton Airfield, North Carolina, and ports of debarkation within the airhead at Camp Mackall Airfield and Pope AFB. The airlift was flown mainly by the Strategic Air Transport Division of the Air Transport Force, with an assist from the Troop Carrier Division. Control of aerial resupply was exercised through the SWARMER airlift planning agency, consisting of a chairman from SWARMER headquarters and representatives from V Corps, CBS, and Air Task Force Swarmer, working through transport movement control offices at the ports.<sup>40</sup> CBS was in charge of loading, lashing, and documentation at the ports of embarkation, and for unlashng, unloading, and documentation at the ports of debarkation. En route, the cargo was the responsibility of the Air Force. In the movement of airborne units, these units themselves were charged with the tasks of loading and lashing.<sup>41</sup>

As to the results of the exercise from the airlift standpoint, it was pointed out following the maneuver that the work of the cargo-loading crews during the strategic airlift was a vital part of the exercise and that this work provided an excellent opportunity for interforce training. Army loading crews and Air Force traffic technicians worked in close liaison, loading Army equipment into Air Force aircraft. Some of the problems that arose were entirely new, particularly those involving the sequence in which equipment was needed by troops in the airhead and the speed that was necessary in dispatching loads. The latter prob-

lem was partially solved by field expedients involving the construction of new loading and unloading facilities for the various types of transport aircraft.<sup>42</sup>

It was believed also that airlift operations would have been smoother if Air Task Force Swarmer liaison officers had been assigned to the ports of embarkation. Lacking such officers, up-to-the-minute information concerning arrival of units and cargo at the ports of debarkation was not available. When units in the airhead required immediate shipment of certain supplies and equipment, a liaison officer at the port of embarkation could have made necessary arrangements to insure shipment by informing the Air Force representatives on the SWARMER airlift planning agency as to the nature of the cargo so that additional aircraft space could be allocated.<sup>43</sup>

Troop carrier units, which, in addition to the delivery of airborne troops during the assault phase of the exercise, flew strategic airlift missions, pointed to certain other difficulties that had cropped up during the airlift. It was found that troop carrier units, with only one crew per aircraft, were at a serious disadvantage in conducting around-the-clock operations. This situation made for excessive crew fatigue. Further overworking of crews resulted from a breakdown in published airlift schedules. Lack of information as to expected delays, and changes in take-off times, made it necessary to keep crews alerted and in a "ready" status. Consequently, breaks in the flight schedule could not be used to rest crews and maintain aircraft. As a solution to this problem, it was recommended that at least two complete crews per aircraft be assigned for operations of this nature and that transport movement control officers should monitor the airlift more closely, keeping operating bases informed of expected delays in flight schedules.<sup>44</sup>

Certain communications difficulties were also apparent during airlift operations. Radio beacons were weak; their frequencies were changed more often than was necessary, and in some cases the same frequencies were used both by control towers and by ground-controlled approach (GCA). In

<sup>40</sup>According to FM 31-40, Supply by Air in Combat Operations, the receiving, packaging, and loading of supplies to be delivered by air is an Air Force responsibility. However, in SWARMER this responsibility was vested in the Army Tactical Air Command was under the impression that the decision to alter prevailing doctrine in this regard was made by General Norstad, the maneuver commander, but the reports of the exercise give no indication as to who made this decision or as to why it was made. Although the Army transportation port companies were experienced in the problems of water transportation, some of the units lacked training in aerial resupply, and it was necessary to conduct intensive air transportability training at the aerial ports of embarkation prior to the exercise (R&E, DR, TAC to DP, TAC, sub Employment of Air Cargo Re-Supply Organization, 17 Mar 1950, in Hist TAC, 1 Jan-30 June 1950, Vol III, doc 319; CBS Final Rpt, in Final Rpt. Exercise SWARMER, Apr-May 1950, p. 41).

addition, aircraft were frequently improperly identified by GCA operators. To correct these shortcomings, it was recommended that stronger beacons be installed where corridor flying was required, that beacon frequencies be checked periodically for trueness, that changes in frequencies be held to a minimum, that different frequencies be used by control towers and by GCA, and that GCA operators be trained to identify accurately each aircraft under their control.<sup>45</sup> Also noted was a lack of pilot proficiency in corridor flying during instrument flight rules (IFR) conditions, and it was recommended that pilots be given more training in corridor flying under visual flight rules conditions prior to flying corridor at close intervals during IFR conditions.<sup>46</sup>

The above criticisms and recommendations pertain chiefly to the mechanics of conducting an airlift operation. Also important are those comments relating to the success of the airlift as a combat exercise. The possibilities of the strategic airlift had been demonstrated during peacetime by the Berlin airlift; SWARMER was an attempt to conduct a similar operation under simulated combat conditions. Following the exercise the feeling was quite general that a number of serious problems had to be solved before a strategic airlift over enemy territory, in support of an airhead within enemy territory, could be considered feasible.

Evidently, SWARMER was not played with sufficient realism to provide a thorough test of the strategic airlift concept. There appears to have been a tendency to conduct the exercise as though it were another Berlin airlift, without taking into account enemy air and ground capabilities. For example, during the afternoon of D-day Mackall Airfield was under enemy artillery fire for several hours, with the shelling beginning at about 1335 hours and continuing throughout the afternoon. The JOC was not notified of this enemy action until 1600 hours; aircraft dispersal at Mackall Airfield was merely simulated, and despite a Red Alert, men remained on the job loading and unloading aircraft. Such

work could not have continued under combat conditions without prohibitive casualties. Moreover, Aggressor forces had blown all three runways at Mackall Airfield and had logged the center of the field. No time factor was computed for the repair of runways or for the removal of obstructions. Nor was time computed for removal from the runways of aircraft damaged or destroyed by enemy fire.<sup>47</sup>

A similar lack of realism was apparent in connection with enemy interference at Maxton Airfield. In planning for supply of the airhead it was assumed that aircraft would land and take off at three-minute intervals. Yet when Maxton Airfield, a port of embarkation, was closed because of enemy action, it was directed to continue normal operations, since any delay would have upset the schedule of three-minute intervals for the airlift.<sup>48</sup> On the other hand, at Pope AFB, a port of debarkation, it was the absence of enemy activity that made transport operations unrealistic. The lack of Aggressor air interference may have been explained by bad weather at Aggressor air bases, but there was seemingly no explanation for the absence of Aggressor artillery and infiltration activity which could normally be expected in a situation of this kind.<sup>49</sup>

A more fundamental question posed by SWARMER was whether the Berlin or stream-type airlift could be conducted under combat conditions over enemy territory. It was agreed that clear-cut air superiority was a prerequisite to success, and for this reason a high degree of air superiority was assumed for Exercise SWARMER.<sup>50</sup> This exercise, it was believed, demonstrated the "vast possibilities" of this type of resupply when enemy air resistance is light, either because of bad weather or because of tactical inferiority.<sup>51</sup>

At the same time, however, strong doubts were expressed concerning the feasibility of this type of airlift. As was the case with the Berlin airlift, this was a stream, or sustained, type of operation, with transports flying singly and at regular intervals. The chief airborne umpire for SWARMER believed that enemy antiaircraft fire would

take a prohibitive toll of aircraft flying a route singly and that enemy fighters, including night and all-weather fighters, would patrol any established route, knowing that a large, defenseless transport would be passing by every few minutes. Although enemy fighters might be eliminated, or grounded by bad weather, it would be almost impossible to neutralize all anti-aircraft weapons even for a short period. Plans would have to be made, he believed, for numerous replacements for aircraft flying such a route.<sup>52</sup>

Unfortunately, bad weather seriously hampered air activity during the exercise and caused most Aggressor missions to be canceled. Hence the effectiveness of fighters against the airlift could not be accurately determined. One incident, nevertheless, furnishes a clue to the hazards attending such an operation. Early on the morning of 2 May, a single Navy attack aircraft, an AD-2 equipped with radar, entered the airlift corridor and, according to authenticated reports, intercepted 13 transport aircraft and destroyed one night fighter. Because of the artificialities involved, the umpires could not rule all 13 transports destroyed, but the implications of the incident are obvious.<sup>53</sup>

It was also pointed out in the final report on Aggressor air operations that United States ports of embarkation and debarkation were so congested that even the small force available to Aggressor air could have caused heavy damage had weather permitted. \* It was believed also that a small number of interceptors, especially night interceptors, could have evaded the transport escort and inflicted prohibitive losses of transport aircraft.<sup>54</sup>

In light of these difficulties, certain conclusions were drawn concerning the prob-

lems attending an airlift operation like SWARMER. In the first place, it was evident that air superiority would have to be assured to such a degree as to prevent heavy losses from enemy air attack and that enemy anti-aircraft action, unless it was extremely weak, would have to be heavily attacked and neutralized.<sup>55</sup> Experience gained in SWARMER indicated also that Berlin airlift type operations would have to be made flexible enough to meet the threat of enemy air action and that periodic changes in routes and in timing would be necessary.<sup>56</sup> It was also recommended that a fighter defense doctrine be developed for the protection of a stream system of airlift and that this doctrine include night fighter and all weather fighter operations.<sup>57</sup> At the exercise critique General Norstad suggested that as a partial solution to the problem of fighter protection, fighter aircraft should be moved into the airhead at the time the airhead is established or as nearly thereafter as possible.<sup>58</sup>

With regard to the problem of enemy artillery and ground action against the airhead, it was pointed out that in SWARMER the airborne assault and the supply of the airhead were conducted in one phase. Such an operation, it seemed, should have been conducted in two distinct phases, the first being the capture of the airhead and the second its supply. An attempt to begin the supply phase before the perimeter of the airhead was secured might, it was claimed, result in the failure of the entire operation.<sup>59</sup>

From the experience derived from Exercise SWARMER, certain important conclusions were drawn concerning the capabilities of the Army and the Air Force for the conduct of an independent airhead operation. It was determined that with the organization and transport aircraft available at the time of SWARMER, the two services were capable of simultaneous delivery by parachute of a regimental combat team of approximately 4,000 men with minimum equipment, at a distance of 750 miles. With the number of C-119's available, it would have been possible to deliver successively no more than three regimental combat teams during any period in which they

\*Airhead congestion was one of the principal problems of the exercise. According to Tactical Air Command, SWARMER had brought out the need for continuing study leading to the development of air transports with detachable cargo compartments, transports such as the KC-120, which at the time of SWARMER was almost ready for its preliminary flight tests. Such aircraft, it was pointed out, could deliver pre-loaded cargo compartments or packs to the airhead, these packs could be quickly detached and towed to dumps, and the aircraft could take off almost immediately with empty packs or with packs loaded with wounded, prisoners, or salvaged equipment. Airhead congestion and saturation of the loading areas would be greatly reduced and losses to enemy attacks on the airhead would be minimized. (Ltr. CG TAC to C/S USAF, sub Tactical Air Command Pack Carrier Requirements, 1 June 1950, in Hist TAC, 1 Jan-30 June, 1950, Vol I, doc 105)

could be mutually supporting. The initial assault could be reinforced by the drop of somewhat less than one regimental combat team every 24 hours. The resupply of these elements, it was believed, would be limited only by the capacity of the forward airfield to receive the men, supplies, and equipment. One important reservation was noted. Without improvement in communications equipment and personnel, the success of such an operation was considered doubtful.<sup>60</sup>

The Air Force role in Exercise SWARMER was not, of course, limited to troop carrier and strategic airlift operations. Yet to be considered are the results of the exercise with reference to tactical air operations in support of the ground phase of the maneuver. At the close of the exercise General Clarkson, who had commanded V Corps, was generous in his praise of the tactical air support rendered by the Air Force during the maneuver.\* This commendation, coming as it did from the ground forces, was especially gratifying to the Air Force. Nevertheless, not all aspects of tactical air operations were to be praised. At the conclusion of SWARMER a great deal of attention was directed to the performance of the forward air controllers (FAC). Although both General Hodge and General Wolfenbarger paid tribute to the work done by the controllers, particularly by those who jumped with the airborne troops,<sup>61</sup> there were also certain criticisms. It was observed that in some cases FAC's had given pilots only the map coordinates of ground targets, instead of actually talking the pilots in to the targets.<sup>62</sup> A further evaluation of the performance of the controllers came from a Tactical Air Command observer who stated that although Army officers, without exception, were satisfied with the work of the FAC's, it was doubtful whether in their present state of training these controllers could have performed their duties satisfactorily under combat conditions. Tactical Air Command, he believed, should discontinue the haphazard assignment of officers as controllers and should establish an organization for the training of officers for these

duties. This observer recommended also that the possibility of having artillery forward observers act as forward air controllers be explored.<sup>63</sup>

An important technical factor affecting the functioning of the controllers who dropped with the airborne troops was the problem of ground authentication. To prevent the enemy from vectoring friendly aircraft onto friendly ground troops, it is necessary that controllers use an authentication system. However, authentication codes were not carried by controllers who were airdropped, since the security risk was too great to allow them to jump into enemy territory with codes on their persons. There were occasions when there was a delay of 10 hours after the controllers had reached the ground before these codes could be placed in their hands. As a solution to this problem, it was recommended that short-time memory authentication codes be devised for use by airdropped controllers.<sup>64</sup>

Closely related to the work of the FAC's is the functioning of the tactical air control center (TACC). It was felt that during SWARMER the TACC should have exercised more rigid control of aircraft within the battle area. Frequently, aircraft with no assigned missions were cleared into the objective area where they had to wait for the TACC to assign them a target. This situation resulted in undue congestion and forced aircraft on pre-planned missions to spend an unnecessary amount of time merely keeping clear of other aircraft. Those aircraft not on pre-planned missions, it was believed, should have been controlled by the TACC from an orbit point and called into the battle area only after that area was generally clear. To help solve this problem of congestion in an airhead, it was recommended that a study be made to determine the number of aircraft that can be controlled effectively and safely in a confined area.<sup>65</sup> It was also suggested that as a means of relieving congestion and improving control the TACC be linked more closely with the FAC's and that to improve coordination, attack times be assigned by the TACC. It was apparent, also, that some of the control

\*See above p 20

difficulties stemmed from the fact that large numbers of close-support aircraft were being controlled through only two VHF radio channels. Much of the congestion in the airhead, it was believed, could have been relieved by assigning additional channels.<sup>66</sup>

Some shortcomings also appeared within the TACC itself. Much of the difficulty was the result of poor physical layout—crowding, high noise level, and incomplete mission-status boards. More serious were the deficiencies that stemmed from the lack of well-trained personnel. Controller's logs were neither complete nor accurate; team coordination within the TACC and with the JOC were poor, and proper radio-telephone procedure and radio discipline were not observed.<sup>67</sup>

Despite these deficiencies in the control of aircraft in close-support operations, such operations were generally satisfactory. Although there were occasions when coordination was lacking and close support could not be furnished, there were instances also when aircraft on air alert delivered attacks on ground targets within three minutes of the time the request was made.<sup>68</sup>

One of the most serious problems faced by ground troops in their operations from within the airhead was the problem of defense against armor. General Hodge stated, in this connection, that an important Army deficiency was the lack of an effective anti-tank weapon for use by airborne troops. Strong tactical air support, with fighter-bombers using 5-inch rockets, he said, would do much to overcome this deficiency. This was not, Hodge pointed out, the entire answer; a sure tank-killer would still be needed at night and during bad weather when air was not effective.<sup>69</sup> As examples of this latter contingency two occasions can be cited during the exercise when the Aggressor was able to make effective tank attacks immediately after the weather closed in and deprived the ground troops of air support.<sup>70</sup>

An additional aspect of close-support operations was the opportunity afforded by this exercise to test the performance of jet aircraft in the close-support role. Brig. Gen. Gerald J. Higgins, an Army officer and chief umpire for the exercise, called the results of

close support by fast flying jets "encouraging," and he was of the opinion that such aircraft were capable of providing effective close support.<sup>71</sup> The chief air umpire expressed a similar opinion, but he believed that more coordination and teamwork were necessary before close support by jet aircraft would be completely satisfactory.<sup>72</sup>

Further observations concerning the capabilities of jet aircraft were made following SWARMER by the 82d Fighter-Interceptor Squadron, which was attached to the 31st Fighter-Bomber Group for the exercise. This squadron, equipped with F-84D's, called the results obtained during ground-support and strafing missions very satisfactory.<sup>73</sup> The squadron also made some significant comments concerning the ability of the F-84D's to cope with F-86's. According to this unit's experience in SWARMER, the F-84D's (fighter-interceptors) were able to gain tactical advantage over the faster F-86's, but only by maneuvering in four-ship flights against F-86's maneuvering in two-ship flights or singly.<sup>74</sup> The 31st Fighter-Bomber Group, on the other hand, flying heavily loaded (simulated) F-84E fighter-bombers, found that these aircraft, if sent without cover into areas patrolled by F-86's, either suffered heavy losses or were compelled to jettison their bombs and rockets to escape interception.<sup>75</sup>

This group learned also, from its participation in SWARMER, that for pre-briefed missions the effective radius of action for the F-84E, with actual ground-attack combat-load, was between 250 and 300 miles, allowing 10 minutes over the target at low altitude. If close-support call strikes were to be carried out, the time over the target would have to be increased to approximately 30 minutes, with a corresponding decrease in radius of action.<sup>\*76</sup>

Of special significance during Exercise SWARMER were the operations of the Tactical Bomber Force. This force, composed of the 84th and 85th Bombardment Squadrons, equipped with B-45 jet-type aircraft and based at Langley AFB, Virginia, flew 151 sorties and simulated the dropping of

\*During SWARMER, the 31st Group was based at Langley AFB, Virginia, approximately 225 air miles from the maneuver area.

587 tons of bombs during the maneuver. At that time these two squadrons were the only jet bombardment units in the Air Force, and the results of their participation in SWARMER are thus of particular interest. It should be noted that these squadrons, at the time they were directed to take part in the exercise, had not yet completed individual training and were not ready for unit training, for them, therefore, this exercise was something in the nature of an experiment. It was determined, from the experience of SWARMER, that because of the high speed, high altitude capabilities, and relatively short range of the B-45 aircraft, an entirely new concept would have to be devised for its employment. For example, it was learned that formation tactics and techniques of World War II would have to be either modified extensively or abandoned completely in order to take advantage of the special capabilities and equipment of this aircraft. Force and concentration requirements would have to be accurately weighed against such factors as radius of action and weather conditions so that the maximum effectiveness of the B-45 could be realized. Participation in SWARMER had provided some of the answers to these problems and had furnished much data upon which to base future jet-bombardment doctrine. As for the units themselves, the experience acquired during SWARMER had done much toward welding them into an effective fighting force.<sup>77</sup>

Valuable experience from participation in Exercise SWARMER was also gained by the 2d Fighter All Weather Squadron. This unit, equipped with eight F-82's and operating from Shaw AFB, South Carolina, was charged with furnishing airborne surveillance and defense at Oceana, Langley, Shaw, Greenville, Maxton, and Mackall airfields during the hours of darkness from 21 April until the conclusion of the exercise on 3 May. The chief criticism of the exercise by this squadron was that the ground-controlled interception (GCI) units were unable to plot aircraft accurately and that their identification of enemy aircraft was poor. Inadequate and improperly calibrated GCI equipment and insufficiently trained

GCI controllers made all-weather and night-fighter operations unnecessarily hazardous, and it was recommended that GCI units working with such aircraft be provided with the best possible radar equipment and that the efficiency of these units be raised by requiring them to train with the various types of flying units.<sup>78</sup>

An important factor in any successful combat operation is accurate visual and photo reconnaissance. For Task Force Swarmer the 161st Tactical Reconnaissance Squadron, equipped with 18 RF-80 aircraft, flew 112 visual-reconnaissance sorties and 241 photo-reconnaissance sorties from its base at Shaw. The squadron believed that the manner of its employment in SWARMER gave a false picture of the unit's actual combat capabilities. Reconnaissance information and photography that this unit could not have furnished under combat conditions were required. For example, units called for large mosaics and detailed visual-reconnaissance information which necessitated flying at low altitude and low airspeed over enemy positions, with the aircraft being exposed to ground fire for long periods of time.<sup>79</sup> Other difficulties stemmed from the squadron's "obsolete" aircraft and camera equipment. Aircraft had to be flown at a dangerously low speed to compensate for outmoded cameras. It was pointed out that even with satisfactory cameras the missions called for could not have been performed effectively in combat since the unit's unarmed and relatively slow RF-80's could not escape interception by faster jet aircraft. It was believed that the unit would suffer prohibitive losses if the level of reconnaissance information and photography required during SWARMER were demanded under actual combat conditions.<sup>80</sup>

The mass production of photographic prints for SWARMER was performed by the 363d Reconnaissance Technical Squadron. Under the procedure for processing aerial photographs set up during this exercise, requests for prints came from the JOC to the 62d Engineer Topographic Company (Army). This unit, after receiving the negatives from the 161st Tactical Reconnaissance Squadron, performed the lithographic



reproduction and then sent the negatives to the 363d Reconnaissance Technical Squadron for photographic reproduction, after which the prints were returned to the engineer topographic company for distribution.

In this exercise the reconnaissance technical squadron's topographic and lithographic facilities were not used; only a photographic production cell was sent into the field. This cell, located at Outer Camp Mackall, was attached to the Army's engineer topographic company, which did the lithographic reproduction and handled distribution. It was believed that the reconnaissance technical squadron's topographic and lithographic facilities should have been committed to the exercise to support the Air Force units involved, rather than attaching part of that squadron to the engineer topographic unit. This latter arrangement left the photographic production cell in the position of not knowing whether its higher headquarters for the exercise was Air Force or Army, and, in addition, this system resulted in unnecessary duplication of printing and in slow distribution of prints.<sup>81</sup>

The 363d Reconnaissance Technical Squadron also reported other deficiencies. On the strength of a requirement that only 5,000 prints would have to be furnished per day, a figure set by higher headquarters, only one photographic production cell was assigned to the exercise. Yet on some days the required production reached 10,000 prints, overloading men and equipment by 100 per cent. It was felt that in the light of such demands an additional production cell should have been employed in the exercise. It was found, also, that the negatives received from the 161st squadron were not given proper titles, an omission that caused confusion and made it impossible to identify some photographs. Some negatives were received in duplicate and seemingly had not been edited; it was discovered also that much of the film was poorly developed and should not have been forwarded as a completed mission.<sup>82</sup>

A criticism frequently made following the

exercise not only by reconnaissance pilots but by fighter-bomber pilots as well was that maps furnished them for the exercise were unsatisfactory. The principal complaint was that the 1:25,000-scale maps that were provided were unsuitable for high-speed jet aircraft. Using these large-scale maps, 88 sheets were required to cover the Fort Bragg and Camp Mackall areas, and the necessity for thumbing through this large assemblage of maps made it difficult for pilots to orient themselves rapidly. To add to the problem, index sheets supplied for use with these maps were unsatisfactory and others had to be improvised.<sup>83</sup> The 31st Fighter-Bomber Group suggested that this problem could be solved by cutting 1:50,000 maps into 100,000-meter pages. It was suggested also that the page key should be approximately 1:200,000 scale, with roads, streams, and other visible features indicated to give the pilot quick and easy access to the geographical area corresponding to a given target number.<sup>84</sup>

The 161st Tactical Reconnaissance Squadron found that the 1:25,000 maps were unusable and that the 1:50,000 maps were too cumbersome for use in the confined cockpit of a fighter. This unit recommended the development of a 1:100,000 map which would retain most of the details of roads, rivers, and vegetation printed on the 1:50,000 maps. It was recommended also that on all maps being used for tactical air operations, grid coordinates be over-printed on each grid square, and that consideration be given to the development of a tactical chart for aerial use rather than ground use.<sup>85</sup>

Perhaps the most serious criticism of Exercise SWARMER pertained to deficiencies in communications facilities and procedures. The major difficulty stemmed from the fact that too few frequencies had been allotted for the tactical air effort. Saturation of channels, with too many controllers operating on a single frequency, caused delay and confusion; some flights were never able to get through to a controller for a target, and, in one unit's estimation, this situation reduced by 50 per cent the num-

ber of targets that could be assailed on a given mission.<sup>86</sup> Still another difficulty was that no specific channel was allocated for reconnaissance aircraft, which had to share channels being used by fighters. The result was that on many occasions reconnaissance aircraft could not make spot reports to the tactical air control center, and it was necessary to wait until reconnaissance aircraft landed before any information could be made available to the using agencies. It was recommended, therefore, that in the future reconnaissance aircraft be assigned a separate channel for spot reports.<sup>87</sup>

Communications difficulties extended also to the functioning of GCI. The effectiveness of GCI suffered seriously from the inability of controllers to track jet aircraft even when these aircraft were flying at low altitude and reduced speed. Much of this difficulty seemed to lie in deficiencies in ground radar equipment. The range, height-finding, and definition capabilities of the World War II type sets used in the exercise could not provide adequate early warning and control of jet aircraft. The experience of Exercise SWARMER indicated a definite need for a radar system capable of tracking jets, one with sufficient range to provide effective control of friendly aircraft and warning of enemy aircraft during an airhead operation. This system should be air transportable, so that it could be placed in operation soon after the first aircraft landed in the airhead. Another suggestion for the improvement of radar coverage during an airhead operation was that a study be made to determine the feasibility of employing airborne search radars as a means of furnishing interim surveillance for the airhead. Also within the realm of possibility was the establishment of an airborne control center, which could provide controlled air protection at distances far beyond the capabilities of a ground control center.<sup>88</sup>

The interception of enemy aircraft during Exercise SWARMER was further complicated by the confusion resulting from poor radio-telephone procedure and discipline. Voice procedure was generally not in accordance with Joint Army-Navy-Air Force publications (JANAP) pertaining to inter-

cept control. This deficiency was a factor in the failure of United States aircraft during the exercise to intercept any Aggressor aircraft before it had accomplished its mission. This failure was in direct contrast with the Aggressor performance in interception operations. Aggressor pilots, chiefly Navy personnel, controlled by Navy controllers and using prescribed JANAP procedures, made many successful interceptions. JANAP's 125 and 142A had been published by the Joint Chiefs of Staff to serve as a basis for standard radio-telephone procedures in the three services. Within the Air Force the decision to use these procedures rested with unit commanders, and as a result many units were untrained in joint procedures. It was recommended, therefore, by the assistant air umpire for SWARMER that the use of JANAP's pertaining to radio-telephone procedures, particularly JANAP's 125 and 142A, be made mandatory throughout the Air Force and that an intensive training program be initiated to indoctrinate all pilots and radio operators in the use of these procedures.<sup>89</sup>

Another important communications shortcoming was the inadequacy of the AN/TRC-7 portable ground radio used by FAC's. These radios were at times so weak that Aggressor radios blotted out friendly transmissions and obtained operational control of friendly aircraft.<sup>90</sup> In light of this experience, it was believed essential that the AN/TRC-7 set be replaced as soon as possible with a more suitable radio.<sup>91</sup>

At the time of SWARMER a vital part of the air-ground communications set-up was the signal company air-ground liaison, an Army unit responsible for the communications within the air-ground operations system, particularly for those communications facilities over which ground force requests for air support were made. Its functioning, therefore, directly affected the air-ground effort and was of special concern to the Air Force. Following Exercise SWARMER, there were numerous criticisms of the performance of this company. Some complaints were voiced by the Air Force,<sup>92</sup> but the sharpest criticism came from the Army. The most vital problem in air-ground

coordination during SWARMER, according to V Corps, was the problem of overcoming the difficulties that stemmed from the inadequate facilities of the signal company air-ground liaison. Poor radio equipment, antiquated cipher devices, and insufficient, and in some cases inexperienced, personnel, it was felt, seriously hampered the air-ground effort. For example, processing of code messages from the JOC to division, including acknowledgement of receipt, consumed upon one occasion 4 hours and 38 minutes. To correct these deficiencies, V Corps recommended that the signal company air-ground liaison be provided with modern equipment for rapid transmission of classified matter, that the T/O&E of these units be revised, and that exercises be conducted to provide special training in air-ground communications.<sup>93</sup>

Besides affording the opportunity to gauge the effectiveness of a wide variety of Air Force activity, Exercise SWARMER made it possible to assess the organization or machinery as it then existed for conducting large-scale airhead operations. As the maneuver commander, General Norstad, saw it, the Air Force and the Army, in the event of a real emergency, should be prepared to conduct such operations. However, the machinery or organization required to carry out such an operation did not actually exist in the field. Therefore, General Norstad stated that he would recommend to the Army chief of staff that V Corps be constituted as a tactical organization, with the 11th and 82d Airborne Divisions, and perhaps the 3d Infantry Division, assigned directly to it. If this recommendation were followed, said General Norstad, the Army would then have a task force in being, capable of conducting SWARMER-type operations.<sup>94</sup>

To balance this proposed Army force, comparable organizational changes would have to be made within the Air Force. Since the Air Force reorganization of December 1948 Tactical Air Command had been merely an operational and planning headquarters under Continental Air Command, with no tactical units assigned directly to it. Units scheduled

to participate in a given joint maneuver were assigned by Continental Air Command to Tactical Air Command's field operational headquarters, Tactical Air Force (Provisional) [TAF (Prov)], but only for the duration of the maneuver. The weaknesses of this organization became apparent during Exercise SWARMER. According to one critic, SWARMER proved that TAF (Prov), as then organized, could not properly perform its mission, that with no tactical units of its own, it was difficult for TAF (Prov.) to test new tactics and techniques or to control the training of units which might be assigned to it for a particular operation.<sup>95</sup> During the SWARMER critique, General Norstad contended that steps would have to be taken to strengthen TAF (Prov.). This organization he said, should have its own units, over which it could exercise constant operational, administrative, and logistical control. General Norstad stated his intention of recommending to the Air Force chief of staff that TAF (Prov.) be reorganized along these lines in order to form the Air Force opposite number to the V Corps task force he was recommending for Army consideration. Only by actually establishing these two organizations, he believed, could the two services be prepared to conduct joint operations in the event of an emergency.<sup>96</sup>

In addition to suggesting the need for organizational changes, Exercise SWARMER made it apparent that the successful conduct of an independent airhead operation in strongly defended enemy territory would require a force in being considerably larger than that employed in this exercise. To insure success, a force capable of conducting corps operations was believed necessary. This force, it was estimated, would have to be equipped with sufficient tactical transport (troop carrier aircraft) to deliver simultaneously the assault elements of three airborne divisions.<sup>97</sup> To perform such a mission, it was calculated that the Air Force would have to maintain a force of approximately 500 tactical transport aircraft, consisting of 400 medium transports (C-119 or equivalent), one heavy transport group, and one assault transport group,

with final requirements for heavy and assault aircraft to be determined after characteristics of such aircraft had been established by field tests. In addition, the Air Force would need sufficient numbers of strategic transport aircraft to support a strategic airlift.<sup>98</sup>

Looking ahead to the creation of such a force, the maneuver commander recommended that a joint airborne center, with Army, Air Force, and Navy representation, be established under the Joint Chiefs of Staff for the study and development of joint doctrine for airborne and airlift operations. This center would make a study of tactics, techniques, communications, and logistics for all types of airborne and air transport operations, and would, upon completion of this study, be maintained as a permanent part of the military establishment.<sup>99</sup>

Following Exercise SWARMER General Norstad made some significant comments relating to the conduct of maneuvers of this type in the future. Although SWARMER was intended to be largely a training exercise, it had developed into a test of new doctrines and concepts, centering around independent airhead and strategic airlift operations. However, General Norstad believed that a single maneuver, on such a large scale, involved such a wide variety of concepts and doctrines that each could not be

adequately tested, particularly when there existed at the same time a training requirement. Therefore, he recommended that in the future, large training maneuvers be preceded by small exercises which would test the various concepts and doctrines individually.<sup>100</sup> There were, for example, several aspects of an airhead operation, not thoroughly tested in SWARMER, that needed to be examined under rigidly controlled conditions. Activities that seemed to require individual field testing included 1) engineer participation in an airhead operation, stressing the problem of rapid airfield construction; 2) operation of fighter aircraft within an airhead; 3) air-ground operations; 4) capabilities of assault aircraft and helicopters; 5) airhead communications and electronics; 6) utilization of transport aircraft, including methods of combat loading and unloading; 7) continuing supply by heavy drop; and 8) development of a sound logistical support organization. Units participating in each test would be limited to those concerned with the particular problem under consideration. It was expected that, following these individual field tests, selected units would execute a large independent airhead exercise in which the individual capabilities, concepts, and doctrines could be tested as an integrated whole.<sup>101</sup>

## CHAPTER IV

## EXERCISE YUKON

In addition to the three major springtime exercises, ASSEMBLY, TARHEEL, and SWARMER, the Air Force and the Army, during the period 1947-1950, joined forces in conducting two large-scale cold-weather maneuvers. The first of these maneuvers, Exercise YUKON, was held in Alaska in the winter of 1947-1948; the second, Exercise SWEETBRIER, took place in Canada and Alaska in the winter of 1949-1950.

Exercise YUKON was executed from November 1947 through February 1948 chiefly by troop carrier units of the Twelfth Air Force working with elements of the Army's 2d Infantry Division in the vicinity of Big Delta, Alaska. The purpose of the exercise was to develop air transportability methods for the Arctic, to indoctrinate air and ground units in Arctic operations, and to gather data which would furnish a basis for development of doctrines, tactics, techniques, and organizations for future Arctic operations.<sup>1</sup>

Air Force units assigned to the exercise were the 62d Troop Carrier Group—a Ninth Air Force unit placed under the jurisdiction of the Twelfth Air Force for the maneuver—and the 57th Fighter Group of the Alaskan Air Command. The ground forces were represented by elements of the 2d Infantry Division, stationed at Fort Lewis, Washington.

The initial planning conference for Exercise YUKON was held at the Pentagon on 7 January 1947 between representatives of the War Department General Staff, Army Ground Forces, Army Air Forces, and Tactical Air Command. This conference was devoted largely to a presentation of the back-

ground of the proposed maneuver and to a discussion of the objectives to be attained by the participating services.<sup>2</sup> General agreement on details for the exercise was reached at a conference held at Headquarters, Army Ground Forces, 3-4 April 1947, between spokesmen for the Alaskan Department, Army Ground Forces, Tactical Air Command, Sixth Army, and the 2d Infantry Division.<sup>3</sup> Further arrangements for the exercise were worked out in May and June during meetings in Alaska between staff officers of Tactical Air Command and representatives of the Alaskan Department.<sup>4</sup>

As a result of these conferences, a plan which set forth the basic outline for the exercise was evolved. The first step in the implementation of this plan was to shift the 62d Troop Carrier Group, which was to perform the airlift for the exercise, from Ninth Air Force to Twelfth Air Force, and to move this unit from Bergstrom Field,\* Austin, Texas, to McChord Field,\* Tacoma, Washington. After engaging in air transportability training with the 2d Infantry Division, the group was to airlift, on a rotational basis, beginning 1 November 1947 and continuing through 5 March 1948, four of the division's reinforced rifle companies to Big Delta, Alaska. This task, which involved the airlift of one company approximately every 25 days, was to be carried out by the group's 4th and 8th Troop Carrier Squadrons.

The 62d Troop Carrier Group's 7th Squadron, in the meantime, was to be moved to Elmendorf Army Air Base (AAB),\*

\*These fields were later redesignated AFB's

Anchorage, Alaska, and placed under the operational control of the Alaskan Air Command. This squadron was to participate in a five-day exercise with each of the four rifle companies. Each company, after deplaning at Big Delta Auxiliary Field from 4th and 8th Troop Carrier Squadron aircraft, was to be picked up by the 7th Squadron and transported to a maneuver area, the first and third companies to Galena, the second to McGrath, and the fourth to Nome.\* Upon completion of its maneuver, each company would be returned by the 7th Squadron to Big Delta, and then moved to Elmendorf to clear Big Delta for 4th and 8th Squadron aircraft bringing in the next company for its exercise. The 4th and 8th Squadron aircraft would then proceed to Elmendorf, pick up the company that had just completed its exercise, and return it to McChord Field, Washington.<sup>5</sup>

Although participation in Exercise YUKON was limited to one troop carrier group, one fighter group, and four companies of ground troops, the complexities of conducting troop carrier operations under severe weather conditions and over great distances made intensive preparatory training mandatory. First, there was the matter of air transportability training for 2d Infantry Division troops. In July 1947 a team from the 82d Airborne Division and a liaison officer from the 62d Troop Carrier Group were placed on temporary duty at Fort Lewis to conduct air transportability training for key officers and non-commissioned officers from units which were to participate in the Alaskan exercise. From 28 July through 16 September the personnel thus trained undertook the training of the four companies scheduled to take part in the maneuver. This training included instruction in loading and tie-down of cargo and equipment, safety regulations, ditching procedure, emergency landings, and rescue and survival in the Arctic. Included also were orientation flights. From 28 August to 16 September, at McChord Field and nearby Gray Field, 2d Infantry Division troops and the 62d Troop Carrier Group engaged in tactical exercises similar to those they would

later stage in Alaska.<sup>6</sup> Training of the 2d Division included also a command post exercise conducted in September for 2d Division officers during off-duty hours. This exercise furnished practice in staff work for the simulated movement of an infantry division from Fort Lewis to bases in Alaska by troop carrier aircraft. The commanding officer of the 62d Troop Carrier Group and officers of the group operations section took part in the exercise in an advisory capacity.<sup>7</sup>

In addition to the air transportability training for the 2d Division, the 62d Troop Carrier Group instituted an intensive training program for its own units. Since the 7th Squadron was to be based in Alaska for the duration of the exercise, special care was taken in training its personnel for Arctic operations. Subjects stressed were navigation, meteorology, and snow landings and ditching, and emphasis was also placed on training in ground-controlled approaches. Further indoctrination in cold-weather operations was provided by three training teams that visited the 7th Squadron during August and September—one from Ninth Air Force headquarters, another from Air Transport Command at Great Falls, Montana, and a third from Scott Field, Illinois. These teams provided instruction in such matters as the employment of C-82 aircraft in Arctic operations, Arctic flying, Arctic survival, and the use and care of Arctic clothing and equipment.<sup>8</sup> In addition, polar indoctrination training was given all squadrons of the 62d Group by a mobile training unit from Chanute Field, Illinois.<sup>9</sup>

The first step in the movement of the 7th Squadron to Alaska was the sending of an advance echelon of 4 officers and 25 enlisted men to Elmendorf AAB. Arriving at Elmendorf on 28 August, this group set about the task of preparing facilities for the arrival of the main body.<sup>10</sup> The remainder of the squadron started its move north on 29 September, and by 15 October the entire unit was in place at Elmendorf.<sup>11</sup>

Upon reaching Alaska, the 7th Squadron was placed under the operational and logistical control of the Alaskan Air Com-

\*See Appendix 4

mand, which had its headquarters at Fort Richardson, Anchorage. Alaskan Air Command, in turn, delegated operational control to its Yukon Sector at Ladd Field,\* Fairbanks.<sup>12</sup> Between 15 October and the beginning of Exercise YUKON on 10 November, the 7th Squadron was occupied chiefly with theater check-out training. For this training the squadron was assigned to the 54th Troop Carrier Squadron, stationed at Elmendorf. The 54th Squadron furnished the instructor-pilots for the theater check-out flights, and each pilot of the 7th was required to fly over all the routes to be used during the exercises. Thus all pilots had the opportunity to familiarize themselves with the maneuver area.<sup>13</sup>

Meanwhile, the 4th and 8th Squadrons of the 62d Troop Carrier Group, back at McChord Field, were completing preparation and training for their role in the exercise—the movement of 2d Infantry Division troops to and from the maneuver area in Alaska. By the end of September air transportability training of the infantry companies had been completed, and in October troop carrier training consisted chiefly of the improvement of pilot proficiency in ground-controlled approaches and instrument flying. Another important aspect of preparations for the exercise was the ferrying of winterized C-82 aircraft from the Fairchild factory at Hagerstown, Maryland, to McChord Field for use in the airlift scheduled to begin early in November.<sup>14</sup>

On 1 November the 4th and 8th Squadrons began the airlift of the first rifle company, Yukon Company A, to Alaska. Two flights of 15 C-82's each moved this company first to Great Falls, Montana, the Air Transport Command aerial port of embarkation. From 4 through 8 November the 30 aircraft were dispatched from Great Falls, in flights of 6 to 9 aircraft each, to Big Delta, Alaska. During this movement overnight stops were made either at Fort Nelson or Fort St John, Canada.† After unloading Yukon Company A at Big Delta,

the aircraft returned empty to McChord Field by way of Anchorage or Fairbanks, and Great Falls, the last aircraft arriving at McChord on 12 November.<sup>15</sup>

On 28 and 30 November, 30 aircraft carrying Yukon Company B were dispatched to Great Falls and thence to Big Delta. After unloading Yukon Company B, the aircraft proceeded to Elmendorf AAB, loaded Yukon Company A, which had just completed its exercise, and returned it to McChord Field, with the movement being completed on 12 December.<sup>16</sup> A similar procedure was followed in the airlift of Yukon Companies C and D. On 4 January 1948 the 4th and 8th Squadrons began moving Yukon Company C to Big Delta, returning to McChord Field by 14 January with Yukon Company B.<sup>17</sup> Movement of Yukon Company D began on 1 February, with the aircraft flying this lift returning Yukon Company C to McChord Field by 13 February.<sup>18</sup> The final phase of the airlift, the return of Yukon Company D from Alaska, began on 26 February. Aircraft departing Great Falls on this mission carried Air Transport Command freight, delivering it along the route to Big Delta. The return flight from Big Delta with Yukon Company D was completed on 5 March.<sup>19</sup>

During the stay in Alaska, each of the four Yukon Companies, in conjunction with the 7th Troop Carrier Squadron, engaged in a tactical exercise of approximately five day's duration. For purposes of the exercise it had been assumed that the United States, late in October 1947, was in imminent danger of attack and that the first thrusts of the enemy were likely to be delivered by air and airborne units striking across the Arctic region at United States fighter bases in Alaska. To meet this threat, the Commanding General, Alaskan Department had requested that a reinforced rifle company be air transported immediately from the Zone of Interior to Big Delta, Alaska. It was in answer to such a request that Yukon Company A had on 1 November begun its movement from McChord Field to Big Delta, where it was to be employed as directed by the Commanding General, Alaskan Department.<sup>20</sup>

On D minus 1 for the first exercise the

\*Later Ladd AFB  
†See Appendix 4

commanding officers of Yukon Company A and the 7th Troop Carrier Squadron at Big Delta were informed by the Commanding General, Yukon Sector that the enemy had captured the airstrip at Point Barrow and that an enemy force estimated at 75 to 100 men had been air-dropped 35 miles north of Galena. Yukon Company A was directed to move by air to Galena to secure Galena Airfield and all communications facilities in the vicinity. On D-day, 15 November, 15 C-82 aircraft of the 7th Squadron, based at Elmendorf, airlifted Yukon Company A from Big Delta to Galena. After unloading the company the aircraft returned to Elmendorf.<sup>21</sup>

To furnish security for the unloading at Galena, a plan was devised to provide an immediate perimeter defense of the airfield. At Big Delta each aircraft had been loaded with a complete infantry unit and its equipment. Troops from the first aircraft to land at Galena were thus able to provide a thin perimeter defense immediately after deplaning. This defense was filled in steadily as the remaining aircraft arrived.<sup>22</sup>

D-day for the Yukon Company A exercise was devoted largely to the airlift and to establishing the defenses of the Galena Airfield. During D plus 1 the company was engaged principally in patrol activity. On the morning of D plus 2, after bombing the Galena bivouac area and airstrip,\* the enemy dropped a parachute company (simulated by dropping of dummies) one and one-half miles northeast of the Galena Airfield. Yukon Company A attacked immediately, and by nightfall the enemy had been driven from the Galena area. On D plus 3, after a night of heavy patrolling, the company was returned by air to Big Delta, bringing to a conclusion the first of the four YUKON exercises.<sup>23</sup>

The role of the 7th Troop Carrier Squadron in the Galena exercise was not confined entirely to the airlift of Yukon Company A to and from the maneuver site. On D minus 3 the squadron dispatched two aircraft to lift a small enemy detail from Big Delta to Galena; on D plus 1, one aircraft trans-

ported 75 cases of rations to resupply troops at Galena; on D plus 2, one aircraft made the enemy dummy parachute drop near Galena Airfield; and on D plus 4, two C-82's returned the enemy detail from Galena to Big Delta. The 7th Squadron's airlift activities for this first exercise were concluded on 26 November with the movement of Yukon Company A from the main maneuver base at Big Delta to Elmendorf AAB, thus clearing Big Delta for the arrival of the 4th and 8th Troop Carrier Squadrons with Yukon Company B.<sup>24</sup>

The exercise at Galena was the first of four exercises which together composed Exercise YUKON. Yukon Company B maneuvered at McGrath in December, Yukon Company C at Galena in January, and Yukon Company D at Nome in February.† These exercises were basically similar to the first exercise at Galena. However, in the second and fourth maneuvers the infantry companies played both sides of the problem, acting first as friendly troops defending an airbase and then playing the part of the enemy attacking an airbase.<sup>25</sup> The troop carrier role for the second, third, and fourth exercises was essentially the same as it had been for the first Galena exercise, involving principally the airlift of the Yukon Companies from the central maneuver base at Big Delta to the various exercise areas and the return of these companies to Big Delta upon completion of their exercises.

Also participating in these maneuvers was the 57th Fighter Group of the Alaskan Air Command. The P-51's of this group provided fighter cover for the troop carrier aircraft flying the airlift, while at the same time other aircraft of the group acted as enemy air, attacking the C-82's engaged in the troop movement. In addition, this group flew a limited number of dive-bombing and strafing missions in support of the ground exercises.<sup>26</sup>

In analyzing the results of Exercise YUKON, consideration will be given first to the airlift to and from Alaska and then to the tactical exercises conducted from Big Delta. The most comprehensive discussion

\*Bombing was simulated by aircraft of the Alaskan Air Command's 57th Fighter Group

†See Appendix 4



of the problems encountered and the lessons learned during the Alaskan airlift is contained in a report by Lt. Col. Paul W. Stephens, commanding officer of the 4th Troop Carrier Squadron. In a tactical sense the most serious difficulty to arise during the airlift was the matter of formation flying along the inland route to and from Big Delta. Here, the weather appears to have been the controlling factor. According to Colonel Stephens, formation flying over this route is impractical because of the poor weather conditions that obtain, particularly during the winter. He pointed out that some instrument flying weather is always encountered along this route and that even when sections of the route were reported as suitable for visual flight rules, in many cases instrument flight conditions prevailed between reporting stations. These circumstances made formation flights difficult. In addition, Colonel Stephens observed that in formation flying, large numbers of aircraft were likely to be on the ground at one time at refueling stops and that in this situation the aircraft would be especially vulnerable to enemy attack. A further difficulty was that in cold weather, while aircraft were waiting to be refueled, engines and oil would cool and even freeze, causing long delays in starting engines and also creating the need for additional maintenance work. In this connection, crew fatigue was also a factor, since preheating of aircraft engines had to be performed by the crews themselves.<sup>27</sup>

Colonel Stephens did not, however, completely rule out formation flights. Provision for sufficient maintenance personnel with adequate equipment, particularly heaters, at cold-weather terminals would, he believed, solve the problem of crew fatigue and would also eliminate long delays by making it possible to start all aircraft engines in a short space of time. If these steps were taken, said Colonel Stephens, formation flights might be feasible, although the problem of bad weather would still have to be dealt with.<sup>28</sup>

Colonel Stephens also made some important comments concerning delays that were encountered during the YUKON

airlifts. Some delays resulted from the high weather minimums established for the airlift. Flights could not take off on the route from Great Falls to Big Delta unless the weather forecast indicated a ceiling of over 3,000 feet and visibility of more than 6 miles at the terminal field. Under these restrictions troop carrier flights were frequently grounded even though other routine flying was in progress up and down the route. Toward the end of the maneuver, however, the airlift was speeded up by the lowering of weather minimums. Delays were also occasioned by the requirement that aircraft could land at Big Delta only during daylight. For the movement of Yukon Companies C and D, however, this stipulation was removed. Further delay resulted from the fact that the only intermediate refueling stop, Fort Nelson, Canada, was often closed by weather when the remainder of the route was open. For future operations of the YUKON type Colonel Stephens recommended that alternate refueling points be established along the route. Such a step Colonel Stephens believed to be especially important if smooth and rapid operations were to be conducted over this route by C-82's.<sup>29</sup>

Included also in Colonel Stephen's remarks was an assessment of the conduct of the infantry troops during the airlift. It was his opinion that these troops seemed to have been thoroughly indoctrinated as to their behavior and that most of the Yukon Companies were cooperative and well disciplined throughout the move. Colonel Stephens noted, however, that one company, which he did not identify, was not nearly so well indoctrinated as the others; on several occasions over-eager junior officers alerted their troops before the final decision to enplane had been made, thus causing confusion among the troops, who usually blamed the aircrews for the long waits in the cold that resulted.<sup>30</sup>

A further assessment of the YUKON airlift was made by the 2d Infantry Division. The division's report stated that Exercise YUKON had proved the practicability of moving ground combat troops and equip-

ment by air from Fort Lewis, Washington, to Big Delta, in company elements, within a period of 6 to 10 days per company. However, this observation was qualified by the statement that the maintenance and tactical employment of such forces at or from Big Delta would require pre-shipment and storage of supplies and equipment at that base. It was further concluded from the division's experience in YUKON that air-base facilities along the inland route from Fort Lewis to Alaska were inadequate for the movement of battalions or large units in less time than would be required for a movement by sea or overland.<sup>31</sup>

This time element appears to have been a matter of special interest and concern to the 2d Division. Its final report on the exercise is somewhat critical of the decision to use the long inland route from McChord Field to Big Delta via Great Falls, Montana. Use of this route, said the report, was unrealistic, making it "nearly impossible" to draw conclusions from the exercise that would be of value in the event of actual hostilities. This report claimed that in wartime the inland route would be flown only if a shorter route were closed by enemy action, or in case troops were to be transported to Canada from the eastern and central parts of the United States. The 2d Division view was that during wartime the shorter coastal air route from McChord Field to Annette Island, to Yakutat or Cordova, to Big Delta would probably be employed.\* Over the long inland route taken in the exercise, six to nine days elapsed before a company of infantry could reach Big Delta. The report indicated that this long time-span resulted from the elaborate safety precautions taken and from the C-82 aircraft's lack of mechanical reliability,† but it went on to observe that a well-coordinated sea, rail, and motor movement, leaving from Seattle, could have placed a company at Big Delta in approximately the same time as that consumed in the airlift.<sup>32</sup>

To set the record straight in this regard, it should be pointed out that Exercise

\*See Appendix 4

†For a discussion of C-82 performance in YUKON, see below pp 40-41

YUKON was not intended to test the speed with which reinforcements could be moved to Alaska. Moreover, the "elaborate safety precautions" mentioned in the 2d Division report were a very decisive factor in determining the time element. Largely because of these precautions and the vagaries of the weather, the 62d Troop Carrier Group's 4th and 8th Squadrons spent approximately 30 of their approximately 40 days of actual participation in YUKON at Great Falls, awaiting safe flying conditions along the route north.<sup>33</sup> Furthermore, it was in the interest of safety that the long inland route had been selected for the airlift. Originally the Air Force had planned to use the over-water or coastal route, but this plan had been rejected. Because of lack of communications, aids to navigation, and airfield and air-sea rescue facilities along the coastal route, it seemed obvious to Air Force planners that the inland route would be far safer.<sup>34</sup> The change to the inland route was made at considerable extra cost to the Air Force. Based on the use of the coastal route, Tactical Air Command had requested special funds amounting to \$31,000 to conduct the exercise, when the inland route was selected, this request had to be raised to \$247,500.<sup>35</sup>

Along with its criticisms, however, the 2d Division made a positive suggestion as to how the move along the inland route might be speeded up. It recommended that in the future, restrictions on ceiling and visibility at departure and landing fields be retained in the interest of safety, but that within these restrictions the commander of the troop carrier unit making the move be authorized to proceed from one base to another in such manner as at such times as he deemed most practicable.<sup>36</sup> A somewhat similar suggestion was made by the 4th Troop Carrier Squadron's commanding officer, who stated that Exercise YUKON could have been improved by allowing flight commanders more freedom to plan flights through weather and to meet other contingencies that might arise during the lift.<sup>37</sup>

It is apparent that the principal difficulty experienced in the exercises conducted from Big Delta by the four Yukon Companies and

the 7th Troop Carrier Squadron was similar to the one encountered in the airlift to and from Alaska—the problem of formation flying. It was found that in the airlifts of troops and supplies to and from the maneuver areas, bad weather seriously hampered formation flying. As a result, these missions were more in the nature of freight hauling missions or administrative flights than tactical troop carrier missions.<sup>33</sup> So frequently were formations disrupted by the weather, that the recommendation was made that a definite standing operating procedure should be set up within troop carrier squadrons to permit the orderly breakup of a formation in the event that instrument weather conditions were encountered.<sup>30</sup>

An important exception in regard to the formation flying problem was the last of the four exercises—the maneuver at Nome in February. This was the only exercise in which the weather permitted formation flying throughout the problem. Low-altitude flying and the maintenance of radio silence made it extremely difficult for “enemy” fighters of the 57th Fighter Group to locate the troop carrier formations. Loading and unloading was accomplished in a minimum time, with 12 C-82's being loaded at Nome for the return of Yukon Company D to Big Delta in only 33 minutes. This exercise, according to the commanding officer of the 7th Squadron, was a source of great satisfaction to members of his unit since it gave them the opportunity to demonstrate sound troop carrier tactics to the infantry and all concerned.<sup>40</sup>

Air Force participation in YUKON was not limited entirely to troop carrier operations. Also taking part was the Alaskan Air Command's 57th Fighter Group. The P-51's of this group flew escort missions for the 7th Troop Carrier Squadron and provided cover during loading and unloading at Big Delta and the other maneuver bases. Other aircraft of the 57th Group played the role of enemy air and were given the mission of intercepting the C-82's flying the airlifts. In addition, dive-bombing and strafing attacks were made by enemy air against troops and installations at the maneuver bases.<sup>41</sup> Dur-

ing the first exercise at Galena in November 1947, enemy air included also P-80's of the 94th Fighter Squadron, a Twelfth Air Force unit undergoing cold-weather tests at Ladd Field at the same time Exercise YUKON was in progress. However, the P-80's of this squadron were grounded early in December, and the unit took no further part in the maneuver.<sup>42</sup>

By the time the first two YUKON exercises, at Galena in November and at McGrath in December, were completed, it was possible to draw some conclusions and to make some recommendations relative to the escorting of troop carrier aircraft. In this connection the formation-flying bugaboo cropped up once more. As might be expected, the 57th Fighter Group found it virtually impossible to provide escort for a string of individual transport aircraft, and no satisfactory solution to this problem could be suggested.<sup>43</sup> During the 12 December airlift from Big Delta to McGrath, even escorted C-82's flying formation were successfully attacked by enemy fighters. Because of poor visibility, escorting fighters flew a poor defensive formation and enemy fighters theoretically destroyed the entire formation of six C-82's. In this case it was recommended that when visibility permitted, escorting fighters should fly tactically loose enough to insure complete visual coverage and that a defensive rather than an offensive escort be flown, thus providing the transports with more protection from enemy fighters.<sup>44</sup>

In the preceding exercise at Galena in November, escorting fighters had had considerable difficulty covering the C-82's because of the poorly coordinated H-hour for troop carrier and fighter aircraft.<sup>45</sup> It was recommended, therefore, by the 57th Fighter Group that in future operations of this type a definite assembly point be designated for the transports and their escort.<sup>46</sup> Better teamwork in the assembly of troop carriers and their escort was achieved during the second exercise and throughout the balance of the Alaskan maneuver.<sup>47</sup>

It should be noted that Exercise YUKON, in contrast to the other joint exercises thus far examined in this study, did not involve

close-support operations. No tactical air control system or joint operations center was established, and although a few bombing and strafing missions were carried out by fighters simulating enemy air, no fighter missions were flown in direct support of infantry ground action. Fighter activity appears to have been injected into the exercises partly to add realism and partly to provide fighter pilots with experience in escorting and in intercepting troop carrier movements. Troop carrier crews also stood to gain from the experience of working with fighter escort and being subjected to attack by hostile fighters.

Exercise YUKON also provided the opportunity to evaluate communications procedures and equipment. The 7th Troop Carrier Squadron found during the first exercise in November that the frequency of the air traffic control station at Elmendorf Army Air Base was overcrowded because of the large number of aircraft making position reports. On one occasion the 7th Troop Carrier Squadron alone had 15 aircraft in the air at one time, each making position reports every 30 minutes. To relieve this congestion, the 7th Squadron communications section set up a ground radio station which kept track of the squadron aircraft at all times when they were out on missions. This station proved very effective, although the necessity for using airborne radio equipment rather than the authorized ground radio equipment posed some difficulties.<sup>48</sup>

During the first exercise at Galena unsatisfactory low-approach ground control of the troop carrier aircraft also presented a problem. As a solution to this difficulty the 7th Squadron employed a novel but effective field expedient. The communications section, working with the engineering section, secured an M-29 cargo carrier, or Weasel, completely modified it, and turned it into a mobile radio control unit. This unit was equipped with one AN/ARC-3 VHF radio set and one SCR-274N HF set (later replaced by an AN/ARC-8), with power being supplied by an auxiliary 24-volt DC power unit. In addition, an SCR-694 radio set was installed, and was powered by the

electrical system of the Weasel. Beginning with the second exercise, at McGrath, and during the problems at Galena and Nome, traffic control, landing and take-off instructions, and parking of aircraft at the maneuver airstrips were all handled from this mobile control unit. Radio contact was also maintained with the 7th Squadron ground radio station at Elmendorf. Thus, the modified Weasel served as a mobile radio control tower and as a ground station for point-to-point communication.<sup>49</sup>

There were, in addition, some general comments made by the 7th Squadron regarding the effectiveness of communications during the exercises. Air-to-air and air-to-ground communications were considered generally better than in the Zone of Interior, a superiority that resulted from the fact that frequencies were less congested. It was noted, however, that displays of aurora borealis seriously disrupted communications, making it impossible to establish radio contact even over extremely short distances. In addition, radio beams were found to swing to a considerable degree in Alaska. Pilots and navigators of the 7th Squadron noticed, for example, that the Summit radio beam might swing as much as 10 degrees within a period of 10 minutes during night flights. This phenomenon created a dangerous situation, for Summit radio is in the center of the valley running between Fairbanks and Anchorage,\* and the swinging of its beam could direct aircraft into the side of the McKinley Mountain Range.<sup>50</sup>

Certain observations relative to communications were also made by the 62d Troop Carrier Group, observations that pertained to the airlift to and from Alaska. Radio facilities along the route north were held to be adequate, but it was believed that these facilities could have been improved by the addition of radar navigation aids such as Loran.<sup>51</sup>

Exercise YUKON also provided a test of radio equipment under extreme cold-weather conditions, and from the experience gained in the exercise it was possible to make some important suggestions regarding the care and operation of this

<sup>48</sup>See Appendix 4

equipment under these conditions. The communications officer of the 4th Troop Carrier Squadron stated that during extreme cold weather sufficient time should be allowed for warm-up of radio equipment prior to operating it. He pointed out that channel-switching motors and gear mechanisms would not operate and that the control cable on the manual compass AN/ARN-11 would freeze unless a warm-up period was allowed and that complete failure of this equipment would result if such precautions were not taken. It was found also that external antenna wires, masts, and loops built up a considerable amount of ice, but not in sufficient quantities to hamper their operation.<sup>52</sup> The AN/APN-12 radar antenna, however, in its extended position picked up enough ice to indicate that during icing conditions either this antenna should not be extended or deicing equipment should be developed and installed so that the extended antenna could be retracted.<sup>53</sup>

An opportunity to gauge the operational capabilities of the C-82A as a transport and as a cold-weather aircraft was also provided during the YUKON exercises. It was the opinion of the commanding officer of the 4th Troop Carrier Squadron that although the C-82A was basically an excellent military transport, it was suffering from "growing pains" and that at the time of YUKON the aircraft presented a very difficult maintenance problem. He also believed that the C-82A was underpowered and that the loss of horizon in take-off was a definite hazard.<sup>54</sup> Pilots of the 62d Troop Carrier Group concluded from their experience in YUKON that the large cargo compartment and the ease with which it could be loaded and unloaded gave the C-82A outstanding advantages as a troop carrier aircraft. However, strong doubts were expressed concerning its mechanical soundness. The single-engine performance of the C-82A was a common topic of conversation among the pilots—a timely topic, it would seem, in light of the 7 engine failures that occurred during the airlift—and the consensus of opinion was that loaded to its maximum gross weight (54,000 pounds) and operating on a single engine the C-82A could not

maintain the minimum altitudes required along this route to Alaska.<sup>55</sup>

The 4th Troop Carrier Squadron commander also contended that the C-82A could not be considered a good cold-weather aircraft, and he pointed out that the deficiencies that were revealed during the original cold-weather tests on the aircraft appeared again in Exercise YUKON.<sup>56</sup> On the other hand, the technical representative of the Fairchild Airplane Company, manufacturers of the C-82, stated that during YUKON there were no difficulties or additional maintenance requirements that could be attributed to cold-weather operations. He claimed that although the winter of 1947-1948 had been a mild one, there was no indication that the C-82A could not have performed equally well in much lower temperatures. One aircraft in particular, he said, had operated in temperatures as low as  $-47^{\circ}\text{F}$  for relatively long periods, and no difficulties were experienced. It was his opinion that the C-82A could be regarded as a satisfactory cold-weather aircraft, which as such made possible the 7th Troop Carrier Squadron's establishment of an operational and safety record superior to that achieved in any similar operation in the past.<sup>57</sup> The claims of the Fairchild representative received some support in the report of the 62d Troop Carrier Group, which stated that a majority of its personnel reporting on the performance of the C-82A agreed that there were no grounds for believing it to be inadequate as a cold-weather aircraft. However, certain modifications were believed necessary, notably improvement of heat control, as well as improvement in the reliability of the micro- and electro-switches in the landing-gear assembly.<sup>58</sup>

Further comments regarding the C-82A came from the 2d Infantry Division. This unit found the C-82A easy to load and unload and reasonably warm at extremely low temperatures. However, it agreed with the

<sup>52</sup>It is true that the safety record was outstanding; only one major accident occurred during the entire exercise, and this accident could not in a strict sense be charged against Exercise YUKON, since it took place while the 62d Troop Carrier Group was returning personnel of the 94th Fighter Squadron to the Zone of Interior after the 94th had completed its Alaska Cold Weather Tests (Hist. 12th AF, July-Dec 1947, I, 150)

observation of the commander of the 4th Troop Carrier Squadron that the C-82A was experiencing "growing pains" Delays caused by mechanical failure, said the 2d Division report, were a constant occurrence. It noted also that several engines had failed in flight, although fortunately no two had failed on the same aircraft at the same time, and that engine trouble, besides contributing to delay, had done much to destroy the confidence of the ground troops in their means of transport. At the same time, however, the 2d Division praised the achievement of the 62d Troop Carrier Group in making four round trips from McChord to Alaska without a single casualty.<sup>60</sup>

The 2d Division also observed that many of the C-82A's mechanical difficulties were

attributable to the excessive demands that were made on these aircraft during the exercise. Original plans for the exercise called for the commitment of all aircraft of the 62d Troop Carrier Group, and during the exercise 90 per cent were actually kept in operation. Plans based on use of only 70 per cent of the unit's assigned strength, it was believed, would have lessened the maintenance problem and eliminated some of the delays.<sup>60</sup> The Twelfth Air Force liaison officer at Great Falls took a similar view of this problem, stating that squadron aircraft commitments should not be 100 per cent and that by holding one or two aircraft per squadron in reserve, maintenance difficulties would be reduced and the over-all movement speeded up.<sup>61</sup>

## CHAPTER V

**EXERCISE SWEETBRIAR**

The Alaskan exercises held in the winter of 1947-1948 were followed two years later by a second cold-weather maneuver, Exercise SWEETBRIAR. Much larger in scope than YUKON, Exercise SWEETBRIAR was a combined and joint sub-Arctic maneuver conducted in February 1950 over approximately 350 miles of the Alaska Highway in Canada and Alaska. Exercise SWEETBRIAR involved not only units of the United States Army and Air Force but also units of the Canadian Army and Royal Canadian Air Force. For the United States Air Force, this exercise had a three-fold purpose: first, to develop doctrines, tactics, techniques, organization, and equipment for Arctic operations; second, to develop troop carrier technique for the airlift of an infantry battalion to an Arctic area and for its resupply; and third, to develop tactics and techniques for fighter, troop carrier, and tactical reconnaissance operations in the Arctic.<sup>1</sup>

The task of coordinating Air Force activities prior to the maneuver devolved upon Continental Air Command. Tactical Air Command monitored Air Force participation and acted as movement-control agency for movement of Continental Air Command units to and from the exercise area. Administrative and logistical support for all Air Force units, except for Aggressor air, were provided by Fourth Air Force, which was also charged with furnishing a troop carrier unit for the exercise.<sup>2</sup>

Air Force units directly engaged in Exercise SWEETBRIAR included the 62d Troop Carrier Group of Fourth Air Force, a detachment of the 161st Tactical Reconnaissance Squadron (PJ) from Ninth Air Force,

a tactical air control party furnished by the 502d Tactical Control Group, Fourteenth Air Force, and from the Alaskan Air Command the 66th Fighter-Interceptor Squadron of the 57th Fighter-Interceptor Group.<sup>3</sup> Playing the role of Aggressor air was the Alaskan Air Command's 449th Fighter All Weather Squadron.<sup>4</sup>

On the Army side SWEETBRIAR was primarily a Fifth Army exercise. The principal units involved were the 1st Battalion of the 14th Infantry Regiment, Battery A of the 537th Field Artillery Battalion, a heavy mortar platoon of the 14th Infantry, and attached medical, engineer, signal, and service units.<sup>5</sup> Aggressor ground forces were composed of elements of the Alaskan Command's 4th Infantry Regiment and 867th Antiaircraft Artillery Battalion.<sup>6</sup>

The principal Canadian ground force unit engaged in the maneuver was the Princess Patricia's Canadian Light Infantry Battalion. Royal Canadian Air Force units committed to the exercise included the 410 (F) Squadron (Vampire), the 417 (F) Squadron (Mustang), the 408 (P) Squadron (Lancaster), the 418 (LB) Squadron (Mitchell), and three transport squadrons.<sup>7</sup>

United States Army planning for Exercise SWEETBRIAR was begun against a fairly broad background of experience in sub-Arctic operations. During World War II, operations had been conducted in Greenland and Iceland and in the Aleutian Island chain, and following the war the Army's 2d Infantry Division had taken part in Exercise YUKON. Originally, the Department of the

Army had contemplated following up Exercise YUKON with a maneuver (TANANA) in Alaska in the winter of 1948-1949, on a battalion combat team scale. However, curtailment of the Army training program and the commitment of Air Force troop carrier resources to support the Berlin airlift forced the cancellation of this exercise.<sup>8</sup>

The vital importance of the Arctic as a potential area of operations brought a resumption of plans by the Department of the Army for an Arctic exercise during Fiscal Year 1950, and late in 1948 preliminary planning was begun for Exercise NORTH STAR (later redesignated CROSSINDEX, and finally SWEETBRIAR). Responsibility for Exercise SWEETBRIAR was assigned to Fifth Army, and the exercise was initiated on 1 November 1948 when the Commanding General, Fifth Army was informed by teletype message from the Office of the Chief of Army Field Forces that one battalion of the 14th Regimental Combat Team, stationed at Camp Carson, would participate in Arctic exercises in Fiscal Year 1950.<sup>9</sup>

The first full-dress Army planning conference for SWEETBRIAR took place in the Pentagon on 8-9 March 1949 between representatives of the Department of the Army, Army Field Forces, and Fifth Army, and at this conference a tentative plan for the exercise was outlined. On 10 March a group of officers from the same organizations, along with officers of the 14th RCT, left Washington for Canada and Alaska, where they made a reconnaissance of the key points in the contemplated maneuver area and conferred at Alberta, Canada, with Maj. Gen. M. H. S. Penhale, General Officer Commanding, Western Command, Canadian Army. On 12-13 March this group held a conference with officers of the Alaskan Command and the Commanding General, U.S. Army Alaska, Maj. Gen. Stanley L. Scott. General Scott had just completed a trip over the Alaska Highway, and he expressed the hope that the contemplated exercise would involve a troop movement over that highway, since it was over this route that his reinforcements would likely come in the event of an emergency.<sup>10</sup>

Army planning for SWEETBRIAR continued with a second Pentagon conference on 5-7 April 1949, and a month later, 8 May, the exercise began its official career when General J. Lawton Collins, then Vice Chief of Staff, Department of the Army, formally stated that SWEETBRIAR would be conducted. Lt. Gen. Stephen J. Chamberlin, commanding general of Fifth Army, was named maneuver commander, and from 22 May to 1 June a group of 14 officers from his maneuver staff made a detailed reconnaissance of the maneuver area and prepared a report which served as a guide for further planning. Additional progress relative to Army planning resulted from a conference held in the Pentagon, 19-21 July, when budget and troop-basis problems were clarified.<sup>11</sup>

Meanwhile, somewhat slower progress was being made in Air Force planning for the maneuver. At the March 1949 conference in the Pentagon the Department of the Air Force representative, following the advice and recommendations of Continental Air Command, announced that because of other commitments the Air Force would be unable to take part in the exercise.<sup>12</sup> However, on 2 May the Air Force decided that it could provide a fighter squadron, a tactical reconnaissance flight, and a tactical air control party for the exercise and suggested that since the Berlin airlift might be discontinued in time to allow troop carrier participation, planning should continue on the supposition that troop carrier units would be available.<sup>13</sup>

Late in May the Tactical Air Command field exercise representative and the Fourth Air Force project officer for the exercise accompanied staff officers from Fifth Army on their reconnaissance of the exercise area, inspecting bases and facilities that were to be used during the maneuver.<sup>14</sup> By the middle of July, planning had progressed to the point where Continental Air Command was able to prepare a draft of the air general plan for SWEETBRIAR.<sup>15</sup> On 10 August representatives of Continental Air Command, Tactical Air Command, and Fourth Air Force attended a combined and joint planning conference at Fifth Army



headquarters in Chicago. At this meeting, which was attended also by personnel from the Department of the Army, the Canadian Army, and the Royal Canadian Air Force and by the commander in chief, Alaskan Command, progress was reported, problems were discussed and clarified, and future planning objectives were outlined.<sup>16</sup> Major problems of command, staff, and supply procedure were resolved during a conference at Fifth Army headquarters, 7-8 September, attended by representatives of Fifth Army, Western Command (Canadian Army), Northwest Air Command (Canada), Continental Air Command, Tactical Air Command, United States Army Alaska, and the Allied Force Command for the exercise.<sup>17</sup>

During the pre-exercise period special attention was devoted to logistical planning. Primary responsibility for logistical support of USAF units (except Aggressor) engaged in the maneuver was assigned to Fourth Air Force. To iron out logistical problems, Fourth Air Force engaged in a series of planning conferences during August and September. At the first of these conferences, held at Whitehorse, Canada, 17-18 August, officers of Fourth Air Force, along with spokesmen for Tactical Air Command, Alaskan Air Command, Northwest Air Command (RCAF), 161st Tactical Reconnaissance Squadron, and 66th Fighter-Interceptor Squadron reached agreement on accommodations and fuel and equipment requirements for the 161st and 66th Squadrons.<sup>18</sup> At a second conference, conducted on 25 August at Fourth Air Force headquarters, Hamilton AFB, California, between Fourth Air Force staff officers and representatives of the 62d Troop Carrier Wing, decisions were reached concerning special equipment, installations, and budgetary matters, with special emphasis being placed on troop carrier needs.<sup>19</sup> In order to tighten liaison between Fourth Air Force and Northwest Air Command (RCAF), logistical planners of the two commands met at Fourth Air Force headquarters on 15-16 September and discussed and resolved various mutual logistical problems.<sup>20</sup>

Early USAF planning culminated in September with the issuance by Continental

Air Command of the air plan for Exercise SWEETBRIAR, which set forth the purpose, concept, and scope of the exercise and outlined the tasks of the major Air Force commands. Also included in the air plan was the command structure for the exercise. The Fifth Army commander was designated maneuver commander, working in conjunction with the General Officer Commanding, Western Command (Canadian Army), the commanding general of Tactical Air Command (USAF), and the Air Officer Commanding, Northwest Air Command (RCAF). The maneuver commander was to be represented in the field by a deputy (USA), with a combined staff responsible for the over-all planning and conduct of the maneuver. These responsibilities would be exercised through an Allied Force commander (USA), who would be aided by a combined staff and who would in turn exercise command of assigned United States and Canadian Army and Air Force elements through an Allied Army Forces commander (USA) and an Allied Air Forces commander (RCAF), with each having combined staffs. The deputy maneuver commander was also to be responsible for operations of the Aggressor force, composed of USAF and USA units and commanded by a USA officer.<sup>21</sup> The organizational structure for the Allied Air Forces provided for an offensive support wing, commanded by an RCAF officer and composed of United States and Canadian fighter, bomber, and reconnaissance units, and a transport wing, also led by an RCAF officer and made up of United States and Canadian transport units.<sup>22</sup>

Exercise SWEETBRIAR was conducted in three phases. Phase I was devoted to preliminary unit training in the United States and Canada. Toward the close of this phase, in late January and early February 1950, air and ground units began concentrating at and near Whitehorse, on the Alaska Highway, in the Yukon Territory, Canada.\* In the longest airlift of fully equipped and organized troops ever undertaken—2,119 miles—750 officers and enlisted men of the 14th RCT were lifted from Peterson Air Force Base, Colorado, to Whitehorse. This

\*See Appendix 5

airlift was accomplished in two movements, on 22 and 27 January, by 27 C-54's of the 62d Troop Carrier Group. On 2 February Canadian ground troops were moved from Wainwright, Alberta, to Whitehorse by Canadian airlift.<sup>23</sup>

Shortly after U.S. ground force elements had assembled, Air Force units began moving into the maneuver area. On 1 and 2 February F-80 aircraft of the 66th Fighter-Interceptor Squadron arrived at the RCAF Station, Whitehorse, from Elmendorf AFB, Alaska.<sup>24</sup> The main body of the 62d Troop Carrier Group's 8th Squadron, which was to participate in the exercise as part of the transport wing, arrived at Whitehorse on 5 February from McChord AFB, Washington.<sup>25</sup> Equipment and personnel of the 161st Tactical Reconnaissance Flight were airlifted to Whitehorse by the 62d Troop Carrier Group on 11 February; this flight's RF-80's arrived at Whitehorse on 16 February, two days after the maneuver had begun.<sup>26</sup>

Phase II of Exercise SWEETBRIAR, 13-23 February, involved the tactical maneuver itself, with combined United States and Canadian forces moving up the Alaska Highway from Whitehorse to Northway, located just west of the Alaskan-Canadian border.† During Phase III of the exercise troops were returned by air and by motor convoy from Northway to Whitehorse, from which point they were moved by air and by motor transport to their home stations in Canada and the United States.

For the tactical phase of the exercise it was assumed that early in December, 1949, an Aggressor force had made a surprise attack on Alaska and had secured the Anchorage-Fairbanks area. After consolidating his gains, the Aggressor advanced in battalion strength and by the end of December had seized the base at Northway. The invasion of Alaska had deprived the United States of strategic bases and had opened the way for the conquest of Canada and the United States. Prompt counter-action was required to remove this threat, and by the middle of December the Canadian and United States

governments had decided to dispatch a combined United States-Canadian force to contain and then push back the Aggressor.<sup>27</sup>

To implement this plan of action, the US Joint Chiefs of Staff alerted portions of the General Reserve in training at Camp Carson and certain tactical air units in the Zone of Interior for immediate deployment to the Alaskan Theater. In late January and early February an infantry battalion and certain air units were to be airlifted from their home stations by way of Great Falls AFB, Montana, to Whitehorse. It was planned that combined and joint United States and Canadian forces would jump off from Whitehorse, attacking up the Alaska Highway toward the Aggressor forces at Northway.<sup>28</sup>

To begin the actual play of the maneuver, Princess Patricia's Canadian Light Infantry Battalion, on D-day, 13 February, moved out of Whitehorse and along the Alaska Highway to contact and delay the Aggressor forces, which had pushed down the highway past Northway. On D plus 1 the Canadian advance elements contacted the Aggressor just beyond the Donjek River, at a point approximately 225 miles northwest of Whitehorse.†† The size of the Aggressor force made a further advance inadvisable, and on D plus 2 the Canadian force pulled back into defensive positions behind the Donjek River, where it would be in a position to cover the concentration of the remainder of the Allied Force.<sup>29</sup>

Meanwhile, the U.S. battalion combat team had left Whitehorse by motor convoy, and on D plus 3 it joined the Canadians at the Donjek River line. At this time Colonel Frank S. Bowen (USA), the Allied Force commander, assumed command of all United States and Canadian ground and air forces. The U.S. battalion combat team was designated as Combat Team A and the Canadian battalion as Combat Team B. On D plus 4 the Allied Force attacked and broke the Aggressor Donjek River line, whereupon the Aggressor withdrew and prepared to make a stand on the north bank of the White River, approximately 40

\*Late arrival of this unit at Whitehorse was caused by a delay in the winterization of its aircraft  
†See Appendix 5

††See Appendix 5

miles northwest along the Alaska Highway from the Donjek.\*

An Allied Force attack on the enemy's White River positions on D plus 6 was successful, and the Aggressor was forced to continue his retreat up the highway. After his defenses at the Canadian-Alaskan border were breached, on D plus 7 and D plus 8, the Aggressor withdrew to his inner defenses at Northway. On D plus 9 the Allied Force engaged in heavy patrolling. A coordinated attack was launched against Aggressor defenses at Northway on D plus 10, 23 February, an attack that included an airborne assault by 100 Canadian paratroops. The Aggressor was routed, and the battle, as well as the tactical phase of SWEETBRIAR, ended at 1030 hours with the capture of Northway.<sup>30</sup>

The USAF role during the tactical phase of SWEETBRIAR was to support the attack of the Allied Army Forces up the Alaska Highway from Whitehorse to Northway. Twenty-five F-80's of the 66th Fighter Squadron, as part of the offensive support wing of the Allied Air Forces, flew a total of 284 sorties from their base at Whitehorse, in providing area cover, close support, and armed reconnaissance for the ground force movement.<sup>31</sup> Also a component of the offensive support wing, the 161st Tactical Reconnaissance Flight, operating from Whitehorse, along with RCAF Lancasters, furnished photographic coverage for the exercise. Since the flight was equipped with only six aircraft (RF-80's), and since it did not begin operations until D plus 4,† only 21 sorties were flown.<sup>32</sup> Processing of aerial photos was accomplished by a photo lab set up at Whitehorse by the 161st Tactical Reconnaissance Flight, and mass production of prints was carried out by the RCAF photo tech lab.<sup>33</sup>

In addition to fighter and reconnaissance activity, USAF participation in SWEETBRIAR included transport operations. During the tactical phase of the exercise, 10 C-54's of the 8th Troop Carrier Squadron (Heavy), as part of the transport wing of the Allied Air Forces, flew a total of 30

sorties in resupplying the ground forces during their drive up the Alaska Highway. Food, fuel, and antifreeze were flown into Burwash Landing, along the highway, and into Snag, near the Canadian-Alaskan border.<sup>34</sup> In addition, two C-82 aircraft of the 314th Troop Carrier Group, attached to the 8th Squadron for the exercise, took part in the resupply paradrops for Canadian airborne troops dropped at Northway on the final day of the exercise.<sup>35</sup>

The role of Aggressor air for the exercise was played by the Alaskan Air Command's 449th Fighter All Weather Squadron, employing four F-82 aircraft. During the maneuver this unit, operating from Ladd AFB, Alaska, carried out a total of 34 missions, involving principally dive bombing and strafing of Allied Force troops and vehicles, and attacks on Allied Force installations at Whitehorse and Burwash Landing. Included also among these missions were bombing attacks against the Donjek River bridge and the dropping of propaganda leaflets.<sup>36</sup>

Although USAF participation in SWEETBRIAR was on a smaller scale than in such exercises as TARHEEL and SWARMER and involved in the tactical phase only two fighter squadrons, one troop carrier squadron, and a reconnaissance flight, its role was much more varied than it had been for Exercise YUKON. In the latter exercise, it will be recalled, Air Force participation was limited largely to troop carrier operations. SWEETBRIAR, on the other hand, provided the Air Force with the opportunity not only for gaining further experience in airlift operations in the sub-Arctic but also for engaging in an air-ground maneuver encompassing a wider variety of tactical air activities.

Exercise SWEETBRIAR was entirely different in concept from Exercise YUKON. In the Alaskan exercise of the winter of 1947-1948 small infantry units were airlifted to various air bases for the purpose of defending these bases against enemy attack. Air-ground cooperation missions were not a part of this exercise. In Exercise SWEETBRIAR, on the other hand, the movement of ground elements up the Alaska Highway was closely integrated with tactical air op-

\*See Appendix 5  
†See above, p 45

erations. Indeed, once it had been decided that SWEETBRIAR would entail a ground attack up the highway, the air role became a secondary one. Movement of troops was restricted almost entirely to the highway itself, and movement in daylight was especially vulnerable to enemy air attack, since deep snow prevented dispersal and concealment of wheeled vehicles off the highway.

This situation dictated the need for a high degree of air superiority. A major lesson learned from the maneuver was that in order to use the Alaska Highway during combat, air superiority is "absolutely essential."<sup>37</sup> However, following the exercise there was widespread criticism of the relatively slight importance assigned the air superiority task of tactical air operations in the over-all concept and plan of the maneuver. It was not until D-day, when the ground forces began their drive up the highway, that the Allied Air Forces' offensive support wing began its air superiority operations. A more realistic plan would have included a provision for gaining at least a degree of air superiority prior to the ground attack. By beginning the road movement before air superiority had been gained, the Allied Force road column was exposed to virtual annihilation by Aggressor air attacks.<sup>38</sup>

The plan for Exercise SWEETBRIAR was, then, tactically unsound. This faulty plan stemmed from the fact that the exercise was originally an Army exercise; the Air Force entered late, after basic planning was well under way. Early Army plans laid down a schedule for the movement from Whitehorse to Northway, and no time was allotted in this schedule for the gaining of air superiority prior to the movement. The result was that when the tactical phase of the exercise began, the offensive support wing was forced to divide its effort; numerous missions had to be flown against Aggressor air bases and in defense of the main home base at Whitehorse, and at the same time the wing had to perform interdiction missions and provide column cover and close support for the attacking road column. Delay of the air superiority

task until ground elements had been concentrated at Whitehorse and had started their movement seriously restricted the interdiction and close-support tasks and presented an unrealistic and unsound picture of the employment of air power.<sup>39</sup>

From the available records of the exercise it has not been possible to determine why after it entered the planning the Air Force failed to secure an adjustment of the Army movement schedule, an adjustment that would have allowed time for the achievement of air superiority prior to the advance from Whitehorse. ConAC's air plan of 29 September 1949 called for air superiority operations to begin on D minus 3, three days before the movement of ground troops,<sup>40</sup> a provision that was in accordance with sound principles. Sometime prior to the exercise, however, this stipulation was eliminated, and no tactical air operations were conducted prior to D-day, when the ground action began. Unfortunately, the exercise reports offer no clue as to why this ConAC plan was changed and why an unrealistic Army plan was ultimately followed.

The organizational structure for the control of tactical air operations during SWEETBRIAR was a rather unusual one. Since the ground forces commander moved forward with his troops, it was necessary to provide him with an air force organization to assist in the production of joint plans. Therefore, a skeleton joint operations center was established. This center moved forward as the ground forces advanced up the highway. Because of a lack of vehicles and adequate communications facilities, the tactical air control center remained behind at Whitehorse, where all tactical aircraft were based.<sup>41</sup> Each day, the operations staff of the JOC coordinated direct support and interdiction requirements for the following day with the G-3 air officer at the JOC. The operations staff and the G-3 air officer then coordinated air superiority, direct support, and interdiction requirements with transport and reconnaissance requirements. A complete air plan was drawn up from this information and was discussed with the army commander at a joint evening con-

ference. The approved air plan was then transmitted to the TACC at Whitehorse for implementation.<sup>42</sup>

This arrangement proved to be generally effective, but was not without flaws. Each time the JOC moved forward an operational shutdown was required, causing disruption of the normal functioning of the JOC until operations could be resumed at the new site. Communications problems added to the difficulties; the JOC had the use of only one radio, one teletype line, and one telephone line; constant breakdowns, frequent moves, and a two-day aurora borealis reduced communications reliability to less than 50 per cent, and the location of the JOC in the field, where it needed both forward and rear communications tentacles, increased the seriousness of this problem.<sup>43</sup>

During Exercise SWEETBRIAR tactical air operations in direct support of the ground attack were limited largely to pre-planned armed-reconnaissance and column-cover missions flown by the offensive support wing. Control of these missions was exercised by TACP's operating with the United States and Canadian infantry battalions. In only a few instances did the ground forces call for immediate support. In fact, only once during the exercise was a request made for immediate support in the accepted sense and through prescribed channels. Only once, also, were aircraft flying missions in direct support of a ground attack controlled by TACP's, although on some occasions the control parties directed strikes against incidental targets. Control parties did control aircraft during pre-planned armed-reconnaissance and column-cover missions, but the virtual elimination of call-type missions from the exercise meant that there was only a limited opportunity to develop the close coordination between ground and air that should normally be a part of close-support operations.<sup>44</sup>

The failure to provide adequate training and experience in requesting and controlling immediate close support for the ground troops stemmed from the fact that throughout the exercise fighter aircraft operated from the rear base at Whitehorse and did

not move to advance bases as the attack up the highway progressed. Thus, distance alone made immediate close support difficult. In addition, the demands made on the offensive support wing in the fight for air superiority precluded intensive close-support activity. The inordinate amount of air strength that had to be devoted to defense of the base at Whitehorse also hampered close-support operations, and even the numerous column-cover missions were flown more for the purpose of defending the column against hostile air attack than for the purpose of striking at ground targets blocking the advance of the ground troops.<sup>45</sup>

In assessing the relative effectiveness of the various types of tactical air missions flown during the exercise, the ground force view was that armed reconnaissance should be placed at the top of the list. Such missions were considered the best means of locating the position of the Aggressor; once his position was disclosed, his vulnerable situation along the Alaska Highway made him an easy target for the Allied Air Forces.<sup>46</sup> Since Aggressor movements, no less than those of the Allied Force, were restricted to the highway, interdiction attacks were especially remunerative.

Although the ground force view of the employment of tactical air tends to emphasize close support more than air superiority and interdiction, in this exercise, at least, the U.S. Army placed great stress upon the need for air superiority and declared that after air superiority, interdiction was the "most economical use of tactical air power."<sup>47</sup> In a further comment on the importance of air superiority and interdiction, the Fifth Army stated in its final report that the exercise demonstrated that the primary objectives of offensive operations in the Arctic are enemy air bases and sources of supply. In this connection the report stated that "disrupting enemy lines of communication is an important means of destroying or denying him his source of supplies and a sound method for bringing about early defeat in his close combat operations."<sup>48</sup>

In addition to armed reconnaissance, column cover, and close support, the offensive support wing ran photo-reconnaissance

missions. The procedure for requesting photo reconnaissance was established by an SOP published by Allied Force headquarters. Requests for air photo coverage originated by ground force units were forwarded to the intelligence officer at Army Force headquarters, who screened and coordinated them and then forwarded approved requests to the JOC. Air Force requests for aerial photography were submitted to the Allied Air Forces commander or his executive for screening and approval. Approved requests were then sent to the JOC. Final decision on all photo requests was made at the JOC and relayed to the TACC at Whitehorse for implementation. Here, the aerial photo missions were planned and coordinated by the reconnaissance officer, who also maintained plots of missions planned and missions actually flown.<sup>49</sup>

A total of 22 reconnaissance missions was requested during the exercise, of which 20 were for photo and 2 for visual reconnaissance. Chiefly because of bad weather, only 11 of the photographic missions were successful. Six of these missions (21 sorties) were flown by RF-80's of the 161st Tactical Reconnaissance Flight; five missions were completed by RCAF Lancaster aircraft. Short-range missions were assigned to the RF-80's and long-range missions to the Lancasters.<sup>50</sup>

The two visual reconnaissance missions flown by the Allied Air Forces were successful. Other visual reconnaissance missions were flown by L-5's and L-17's belonging to Army aviation of the Allied Force. These liaison-type aircraft flew a total of 129 visual reconnaissance missions during the exercise. Equipped with skis, the L-5's and L-17's were able to stay close to the ground force headquarters by using frozen lakes and rivers as landing strips. The ground forces were well pleased with their performance and recommended that Army aircraft, equipped with skis, be provided all units of battalion size participating in Arctic or sub-Arctic operations.<sup>51</sup> However, the ground forces made no estimate as to whether such aircraft could be depended on in actual combat without a high degree of air superiority.

How, even in this exercise, these aircraft were able to perform effective visual reconnaissance missions while a continuing battle for air superiority was being waged is not explained.

In general, the ground forces were well satisfied with the quantity and quality of the photo coverage provided. All but 10 miles of the Alaska Highway along the maneuver route was photographed, and this coverage was used by ground commanders at all echelons as an aid to tactical planning and operations.<sup>52</sup> The most severe criticism to come from the ground forces was that there was a "serious breakdown" in the delivery of photos after they had been developed and printed. After mass reproduction had been completed by the RCAF processing section at Whitehorse, prints were delivered to the most forward operational landing strip, and from this point to Allied Force headquarters. However, no definite plane assignment for delivery of prints was made by the Allied Air Forces, and although many prints arrived promptly, some did not reach Allied Force headquarters until 36 hours after the specified time of delivery.<sup>53</sup>

Further criticisms of the effectiveness of photo reconnaissance were made by the Allied Air Forces. Here the chief complaint was that the late arrival of the 161st Reconnaissance Flight's RF-80's made it impossible to carry out a photo-reconnaissance plan which had envisioned pre-exercise coverage of approximately 30 airfields as well as coverage of certain areas vital to the ground forces. The RF-80's did not participate until D plus 4, and because of their tardy arrival, bad weather, and Aggressor interference, it was not until after D plus 7 that suitable photo coverage of Northway, the final exercise objective, could be provided.<sup>54</sup>

Commenting on the results of Exercise

\*It should be noted that the above method of delivering prints to the ground forces was not in accordance with usual procedure. Delivery of prints to Army units is not an Air Force but an Army function. FM 31-35, Air-Ground Operations, states that arrangement for such deliveries is the responsibility of the Army photo-interpretation center. Since such a center did not function during SWEETBRIAR, arrangement for delivery of prints was evidently made the responsibility of the RCAF photo-processing center at Whitehorse. This center, in effect, functioned in place of an Army photo-interpretation center, handling mass reproduction of prints and arranging for their distribution to the Allied Force headquarters.

SWEETBRIAR, the 161st Tactical Reconnaissance Flight stated that because of its late arrival, the ground forces did not receive all the photography they desired. Moreover, the photography produced was for the most part inferior in quality, and camera malfunctioning also lowered the over-all photo output. It was believed that these difficulties could have been overcome if the unit had had the advantage of a pre-exercise training period at Whitehorse. In spite of these deficiencies, the unit believed that it had provided adequate photography for the missions flown. In addition, certain valuable lessons had been learned; techniques necessary for cold-weather operations had been developed, and it had been proved that photo-reconnaissance operations could be carried on under cold-weather conditions.<sup>55</sup>

In addition to the various tactical air operations discussed above, the Allied Air Forces during SWEETBRIAR also furnished transport support for the ground units. This assistance was provided by the transport wing, which along with the offensive support wing composed the Allied Air Forces. Made up of three RCAF transport squadrons and USAF's 8th Troop Carrier Squadron, the transport wing airlifted 260 tons of supplies from Whitehorse to forward airstrips near the Alaska Highway at Burwash Landing and Snag,<sup>56</sup> with 152 tons of this total being lifted by the 8th Troop Carrier Squadron.<sup>57</sup> The fuel and rations moved by air to Burwash Landing and Snag, after the landing strips at these points had been seized by the ground advance, were vitally needed by the Allied Force pushing up the highway. The importance of these resupply missions may be gauged from the comment made by the Canadian Army following the exercise that without the resupply furnished by the combined air forces, it would have been impossible to have brought Exercise SWEETBRIAR to a successful conclusion.<sup>58</sup>

As a result of USAF's participation in SWEETBRIAR, certain important lessons were learned relative to airlift operations. For example, the exercise made it possible to test the usefulness of the C-54 as a short-

range transport. On 12 October 1949 the 62d Troop Carrier Group had been reorganized as a heavy unit, and its C-82's were replaced with C-54's.<sup>59</sup> Technical orders for the C-54 established a maximum gross landing weight of 62,000 pounds for the aircraft. During SWEETBRIAR it was found that with this maximum it was impossible fully to load the aircraft for its resupply missions. Because of this limitation, it was concluded that the support lifts conducted during the exercise, particularly those flown to Burwash Landing, only 120 nautical miles from the home base at Whitehorse, were uneconomical for the C-54. In light of the experience of SWEETBRIAR, it was recommended that the C-82 or C-119 aircraft be employed for similar operations in the future.<sup>60</sup>

Exercise SWEETBRIAR also demonstrated the need for a more efficient system of loading and unloading transports. Lack of such a system in this exercise resulted in a long turn-around time in the landing zone; forward airstrips were overly congested, and aircraft were exposed too long to the threat of enemy action. As a remedy, it was suggested that air combat loading units be included in the augmentation of troop carrier units committed to tactical transport missions. It was recommended that these units be composed of trained loading crews and special equipment, including at least two 2½-ton high-lift trucks, one heavy fork-lift, and loading ramps suitable for the type of aircraft to be used.<sup>61</sup>

Some of the most important findings relative to resupply operations were those presented by Fifth Army. After first stressing the vital importance of air superiority within the area where resupply is being conducted, the Fifth Army report stated that the experience of SWEETBRIAR indicated that large cargo-carrying aircraft could transport supplies to forward airstrips in quantities sufficient to support one reinforced regimental combat team from each airstrip. However, said the report, it was apparent that a need existed for experimentation in the use of tracked landing gear and skis for resupply aircraft. So equipped, these aircraft could then land on

the deep snow covering the frozen lakes in the sub-Arctic, thus multiplying landing points for resupply of the ground forces.<sup>62</sup>

It is a truism that military operations cannot be conducted without control and that control cannot be exercised without communications. Exercise SWEETBRIAR, like the other training exercises considered in this study, emphasized the necessity for adequate communications at all levels. Communications between the JOC and the TACC are especially important to the smooth functioning of tactical air operations. The maintenance of good communications is not overly difficult when the TACC is located in its usual position adjacent to the JOC. In Exercise SWEETBRIAR, however, the JOC moved forward with Allied Force headquarters as that headquarters followed the ground attack up the Alaska Highway, while the TACC remained at Whitehorse throughout the maneuver. This arrangement complicated the communications problem, for the JOC had to maintain both forward and rear communications tentacles—to the TACP's forward and to the TACC in the rear.<sup>63</sup>

For its communications with the TACC, the JOC was provided with one telephone line, one teletype line, and one radio. During the planning stage of the exercise it was presumed that these facilities would be adequate, but the activity of the maneuver mushroomed far beyond expectations, with the result that communication lines were heavily overloaded.<sup>64</sup> Communications problems were made more acute by breakdown of equipment, by atmospheric disturbances such as aurora borealis, and by the repeated moves forward by the JOC.<sup>65</sup>

Difficulties were also experienced in maintaining communications forward from the JOC to the TACP's. Under normal conditions the TACP's would not be in direct radio communication with the JOC; however, in this exercise, with the JOC located forward of the TACC at Whitehorse, it was necessary to link the TACP's directly with the JOC. It is normal practice also that requests from ground units for air strikes are made over ground force communications channels. In Exercise SWEETBRIAR,

however, such requests were made over air force channels through the TACP's.<sup>66</sup>

The JOC used the SCR-399 radio for communication with the TACP's. However, because of a shortage of SCR-399's the TACP's were equipped with radio sets of lower power output, and distances between the JOC and the TACP's usually exceeded the voice range of the equipment available.<sup>67</sup> Even if there had been an adequate supply of SCR-399's, their weight (6,595 pounds) precluded mounting them on the over-snow vehicles being used by the TACP's. In view of these circumstances, it was recommended that TACP's be equipped with a compact, high-frequency radio that could be mounted on over-snow vehicles.<sup>68</sup>

Thus far, in assessing the results of SWEETBRIAR, attention has been directed toward certain specific Air Force activities and functions—offensive support, reconnaissance, resupply, and communications. It remains to set forth the general over-all lessons learned from the maneuver. During the exercise critique, held on 26 February 1950 at Camp McCrea, near Whitehorse, the following major findings relative to air operations were emphasized by the USAF representative:<sup>69</sup>

1. Air superiority is absolutely essential if the Alaska Highway is to be used in wartime.
2. Air forces may be effectively employed in the SWEETBRIAR area in mid-winter.
3. Both air and ground forces must be unusually strong in engineer and maintenance units.
4. The use of air transport to supply ground forces is not only feasible but is probably the most efficient method of support. Troops and supplies can, if air superiority is achieved and maintained, be moved over the Alaska Highway. This being the case, it is a sound assumption that in the event of war Alaska can be reinforced by this line of communication.

In addition to these conclusions, the USAF spokesman at the critique stated that the experience of the exercise suggested the need for a more extensive use of existing airstrips for fighter bases and for the movement and supply of troops. It was also



deemed essential that use be made of frozen lakes as air bases in order to facilitate greater dispersion of aircraft.<sup>70</sup>

Also dealing with the over-all results of Exercise SWEETBRIAR as they pertained to air operations, General Chamberlin, the maneuver commander, set forth the following as significant general lessons of the exercise:

1. Given air superiority, a military force can use the Alaska Highway in mid-winter for the movement of personnel, supplies, and equipment.

2. Air operations, based on existing facilities and on improved airstrips located on frozen lakes, are feasible in mid-winter along the Alaska Highway.

3. Successful ground combat along the Alaska Highway is largely dependent upon

preliminary reduction of hostile air power.

4. All defensive positions along the highway are subject to reduction and capture by airborne troops dropped in the rear of such positions. The existence of only one main axial road in the area makes any position untenable once the highway behind it is cut. Airborne operations are facilitated by the almost unlimited drop zones and landing strips that exist in mid-winter in the form of frozen lakes and streams.

5. Denial of the Alaska Highway and its adjacent airfields to a military force would preclude movement of that force in any direction in the SWEETBRIAR area of Canada and Alaska.

6. The destruction or denial of shelter or supply to the enemy would, in mid-winter, minimize the size of the force necessary to destroy him.<sup>71</sup>

## EXERCISE SNOWDROP

In addition to the major postwar joint maneuvers—ASSEMBLY, T A R H E E L, SWARMER, YUKON, and SWEETBRIAR—the Army and the Air Force staged a number of smaller exercises. The first of these small-scale maneuvers was Exercise SNOWDROP. A cold-weather exercise conducted almost simultaneously with YUKON, SNOWDROP was held in the winter of 1947-1948 at Pine Camp, New York.

The principal Air Force units assigned to the exercise were the 36th, 37th, and 38th Troop Carrier Squadrons of the 316th Troop Carrier Group, Ninth Air Force. Other Air Force participants included the 838th Engineer Aviation Battalion of Strategic Air Command, and a mobile weather detachment from Headquarters Mobile Weather Squadron, Tinker Field, Oklahoma. In addition, a helicopter was furnished by the 163d Liaison Squadron, and two radio-control jeeps were provided by the 502d Tactical Control Group.<sup>1</sup>

The chief ground unit committed to the exercise was the 2d Battalion of the 505th Parachute Infantry Regiment, 82d Airborne Division. Also taking part were Battery A, 456th Parachute Field Artillery Battalion, and a platoon of Company B, 307th Airborne Engineer Battalion, along with two medical detachments and a number of service and maintenance detachments.<sup>2</sup>

Exercise SNOWDROP was primarily an Army Ground Forces maneuver, conducted with Air Force assistance. Responsibility for planning, conduct, and supervision of ground activity was vested in the First Army commander, who in turn assigned

responsibility for conduct of the tactical exercise itself to the commanding officer of the 505th Parachute Infantry Regiment. Over-all responsibility for Air Force participation fell within the province of Tactical Air Command, which assigned the mission of planning for and providing air support for the exercise to its Ninth Air Force.<sup>3</sup>

From the ground force standpoint Exercise SNOWDROP was designed to: 1) indoctrinate personnel of the 505th Parachute Infantry Regiment in cold-weather operations; 2) develop airborne and air transportability tactics and techniques in cold-weather operations; 3) develop and test airborne equipment essential to over-snow operations; 4) develop such aspects of organization and operation of an initial airhead as means and personnel would permit.<sup>4</sup> Of special concern to the Air Force was the testing of airborne equipment and the development of air transportability techniques for cold-weather, over-snow operations.<sup>5</sup>

AAF planning for Exercise SNOWDROP began on 14 March 1947 with a joint conference between representatives of Tactical Air Command and Army Ground Forces. At this time Army Ground Forces requested troop carrier support for the exercise, and Tactical Air Command agreed to furnish it on an individual mission basis. This agreement was confirmed in correspondence on 22 March, and planning for the exercise began immediately.<sup>6</sup> In April, planning continued with an inspection of Pine Camp, New York, by representatives of Army

Ground Forces, Fifth Army,\* 82d Airborne Division, and Ninth Air Force. Following this inspection trip, Tactical Air Command directed Ninth Air Force to send a planning officer to First Army headquarters, Governor's Island, New York, to assist in the preliminary planning of the troop carrier phase of the exercise.<sup>7</sup>

Preliminary planning proceeded on 25 June with a conference held at Pine Camp between spokesmen for Army Ground Forces, First Army, Tactical Air Command, and Ninth Air Force. Upon their return from this conference, the Ninth Air Force representatives briefed their commanding general and key members of his staff, and after further staff study, Ninth Air Force forwarded a condensed report of planning to Tactical Air Command for coordination and implementation. In a conference held at Tactical Air Command headquarters late in August, Ninth Air Force officers were oriented by the A-5 section, Tactical Air Command with regard to the details of troop carrier participation in the exercise. Matters discussed at this meeting were incorporated into a Tactical Air Command directive which was forwarded to Ninth Air Force on 9 September for further planning and subsequent execution.<sup>8</sup>

During preliminary Army Ground Forces planning, it was contemplated that Exercise SNOWDROP would be divided into five phases: 1) individual training and indoctrination, 1-30 November 1947; 2) small unit training—squad and platoon, 1 December 1947-10 January 1948; 3) company and battery training, 11-24 January 1948; 4) battalion training, 25 January-8 February 1948; 5) regimental combat team training, 9-29 February 1948.<sup>9</sup> However, because of the low troop strength of the 82d Airborne Division, regimental combat team training was eliminated from the exercise, and later plans called for the termination of the maneuver on 8 February, upon completion of battalion training.<sup>10</sup>

During the entire period of the exercise, 1 November 1947-8 February 1948, support for the training of the 505th Parachute In-

fantry Regiment was furnished by the 316th Troop Carrier Group. However, this support was provided on a mission basis only, with missions limited to a duration of 72 hours. Troop carriers operated from their home station at Greenville AFB, South Carolina, using Rome AFB, New York, as a staging depot and Wheeler-Sack Field at Pine Camp as a forward landing strip. Assisting troop carrier operations were the mobile weather detachment from Tinker Field, Oklahoma, a detachment of the 838th Engineer Aviation Battalion, and an AACS detachment from Rome AFB.<sup>11</sup> These detachments, under the control of an advance echelon of the 316th Troop Carrier Group, operated Wheeler-Sack Field throughout the exercise.<sup>12</sup>

Lack of sufficient snow in the Pine Camp area during the period 1 November-20 December made it necessary to revise the original schedule for the exercise. Phase 1—individual training—was considerably retarded, and the platoon airborne problems, originally planned for Phase 2, had to be canceled. The 316th Troop Carrier Group did, however, drop paratroops for jumpmaster qualification early in November,<sup>13</sup> and during the second week in January 1948 the group participated in company airborne problems.<sup>14</sup>

The high point of Exercise SNOWDROP, for air and ground participants alike, was the battalion combat team maneuver which took place during the first week of February. For the purposes of the problem it was assumed that Aggressor forces had invaded the North American continent, had overrun a large part of Canada, and had pushed into the United States to a line Bridgeport, Connecticut—Scranton, Pennsylvania—Buffalo, New York. United States forces had halted the Aggressor advance at this line in the autumn of 1947, and the enemy had evidently decided to wait until spring to resume his attack.<sup>15</sup>

United States forces planned a winter offensive to drive back the invader, and the battalion combat team maneuver was a part of this offensive. The over-all plan of attack called for the establishment of an airhead behind enemy lines in the vicinity of the

\*Initially, responsibility for conducting SNOWDROP was assigned to Fifth Army. On 12 May 1947 this responsibility was transferred to First Army.

junction of the St. Lawrence River and Lake Ontario. From this airhead a drive south would be launched aimed at recapturing Syracuse and Utica from the Aggressor. Seizure of the southern section of this airhead—the Pine Camp area—was made the responsibility of the 82d Airborne Division. The division, in turn, gave to its 505th Parachute Infantry Regiment the mission of capturing Wheeler-Sack Field at Pine Camp and securing the Fargo-Herring area, five to ten miles east of Pine Camp,\* as a line of departure (LD) for a later attack to be launched by airlanded troops. The task of seizing this LD fell to the 505th Regiment's second battalion, and it was this operation which provided the basis for the culminating phase of Exercise SNOWDROP—the battalion combat team exercise.<sup>15</sup>

Air Force participation during this final phase involved the airdrop of the battalion combat team in the Fargo-Herring area. D-day was set at 3 February. On the preceding day 21 aircraft of the 316th Troop Carrier Group left their home base at Greenville, South Carolina, and proceeded to Wheeler-Sack Field. On the morning of D-day, 18 C-82's, up to that time the largest number of Fairchild "Packets" ever to take part in a mass paratroop drop, took off from Wheeler-Sack Field with 500 paratroops and dropped them in the vicinity of the dominant terrain features between Fargo and Herring. Ammunition, 75-mm. howitzers, 57-mm. guns, machine guns, and skis were also dropped to supply the airborne troops. After landing, the battalion combat team organized quickly and then made an eight-mile march over snow to its first objective. A three-day ground maneuver followed during which the troops sustained themselves solely on equipment and supplies carried during the original jump, augmented by supplies dropped later by seven C-82's.<sup>17</sup>

The drop of the battalion combat team on D-day was a successful one. Flying a tight formation at a drop altitude of 600 to 800 feet, the C-82's delivered the entire battalion within a drop zone measuring 1,200

by 500 feet.<sup>18</sup> Less satisfactory was the re-supply mission flown during the ground maneuver; in this case some loads were dropped as far as four miles from the drop zone.<sup>19</sup>

Most of the difficulties encountered by the 316th Troop Carrier Group during Exercise SNOWDROP centered around the operation of Wheeler-Sack Field. The removal of snow from the airfield was an especially troublesome problem. Snow-removal equipment provided by First Army proved inadequate, and the 838th Engineer Aviation Battalion detachment, whose responsibility it was to keep the runways clear, was untrained both in snow-removal methods and in the operation of the snow-removal equipment that was available. These deficiencies resulted in loss of time, increased maintenance load, and some damage to runway and taxiway surfaces and to installed lighting facilities. As a solution to the problem of snow-removal, it was recommended by the commanding officer of the 316th Troop Carrier Group that in future operations of this type, snow-clearing equipment especially suited to air-drome snow-removal be provided and that the furnishing of such equipment be made an Air Force, rather than an Army, responsibility.<sup>20</sup>

Some aircraft maintenance problems were also experienced during stop-overs at Wheeler-Sack Field. Since Rome AFB was used as a staging depot and aircraft were in no case to remain longer than 72 hours at Wheeler-Sack, only limited maintenance was performed at the latter field. First and second echelon maintenance were accomplished by crew chiefs and their assistants. This arrangement did not prove entirely satisfactory, and as a remedy the 316th Troop Carrier Group suggested that when eight or more group aircraft participate in operations like SNOWDROP, a detachment of the wing maintenance and supply group should be located at the forward airfield.<sup>21</sup>

Inadequate equipment was also a complicating factor at Wheeler-Sack Field. The towing tractor proved worthless for towing aircraft over ice-covered ground, and the 20 x 40 foot tarpaulns provided were too

\*See Appendix 6

heavy and hard to handle for use as wing covers on the C-82 aircraft. More serious was the lack of proper crash fire-fighting equipment at Wheeler-Sack. Air Materiel Command had furnished a Type 155 crash fire truck, a C-2 wrecker with a 40 foot trailer, and an ambulance. However, this equipment had just been removed from storage, and it was only partially operational. Proper maintenance facilities were lacking at Wheeler-Sack, and Air Materiel Command had provided no repair kits with these vehicles. When they required maintenance, it was necessary to drive them to Rome Air Depot, a round trip of over 150 miles; and the result was that for extended periods of time there was no crash fire-fighting equipment available at Wheeler-Sack.<sup>22</sup>

The safe and efficient conduct of operations from Wheeler-Sack was further complicated by poor weather service. Although a mobile weather detachment was stationed at the field during the exercise, no equipment was furnished for forecasting weather. The only weather information available was that transmitted from facsimile equipment at Rome Air Depot, and it was pointed out following the exercise that weather service should have been improved by the installation of a teletype net for the receipt of hourly weather reports.

As is so often the case in training exercises and in combat operations, Exercise SNOWDROP was plagued by communications difficulties. The 502d Tactical Control Group had provided two jeeps, equipped with radio sets AN/VRC-1, for aircraft control at Wheeler-Sack and at the drop zone. Upon the conclusion of the exercise, the commanding officer of the 316th Troop Carrier Group reported the following deficiencies in this equipment:

1. Because of the lay-out of Wheeler-Sack Field, it was impossible to see the ends of the runways from the AN/VRC-1, a factor which rendered proper airdrome control impossible.

2. No side curtains were installed on the radio-control jeeps, and as a result these vehicles could not operate for sustained periods in cold weather.

3. The AN/VRC-1 radio sets were not supplied with proper tuning units or crystals.

4. Because the hilly terrain surrounding the drop zone blocked straight-line transmission, the VHF section of the AN/VRC-1 could not provide adequate aircraft control.

5. The SCR-522 radio sets, components of the AN/VRC-1, were old and unreliable.<sup>23</sup>

In light of these deficiencies it was suggested that the following communications equipment be provided for future operations of the SNOWDROP type:

1. A radio set SCR-624 for airdrome control.

2. A radio set SCR-299, or equivalent, to be used for homing.

3. A radio set AN/VRC-1, with an elongated antenna mast, or a specially designed unit employing the AN/ARC-3, for drop-zone ground control.

4. A radar set AN/PNN-2 or AN/UPN-4 to be used as a homing device at the drop zone.<sup>24</sup>

In addition, it was recommended that the troop carrier group and the maintenance and supply group be held responsible for the procurement, installation, and operation of airdrome and air-ground communications equipment and that the maintenance of this equipment be performed by a third and fourth echelon team provided by the maintenance and supply group.<sup>25</sup>

## EXERCISE TIMBERLINE

Hardly had Exercise SNOWDROP been completed in February 1948, when Tactical Air Command's Twelfth Air Force began preparations for Exercise TIMBERLINE, which was staged in March 1948, in cooperation with troops of the Army's Mountain Winter Warfare School, Camp Carson, Colorado. Held in the rough, mountainous region approximately 90 miles northwest of Colorado Springs, TIMBERLINE, so far as the Air Force was concerned, had as its objectives the training of personnel in joint air-ground operations and the testing of the suitability of P-80's for fighter-bomber attacks on targets above 10,000 foot elevation in mountainous terrain.<sup>1</sup>

Air Force participants in the maneuver included the 71st Fighter Squadron (JP) of the 1st Fighter Group, the 12th Reconnaissance Squadron Photo (JP) of the 67th Reconnaissance Wing, and two tactical air control parties (TACP). The fighter squadron operated from Peterson AFB, Colorado Springs, and the reconnaissance squadron photo from Lowry AFB, Denver, Colorado. Twelfth Air Force also set up a portable photo lab at Lowry for processing of aerial photos.<sup>2</sup>

The principal Army unit involved was the 38th Regimental Combat Team, school troops of the Mountain Winter Warfare School. This regiment furnished both friendly and enemy ground forces for the maneuver, the main body of the regiment, including part of the regimental trains, composed the friendly force; and the regimental antitank company, along with the

balance of regimental trains, played the part of the enemy force.<sup>3</sup>

Joint planning for Exercise TIMBERLINE began on 25-26 February 1948 with a conference at Camp Carson, Colorado, between representatives of Twelfth Air Force and the 38th RCT. At this meeting it was agreed that Twelfth Air Force would provide P-80's for fighter-bomber attacks, personnel for TACP's, an air liaison officer, and a combat operations officer for the JOC. It was agreed also that Peterson AFB would be used as a base for participating P-80 aircraft. The agreement on these points was presented to the Commanding General, Twelfth Air Force, who gave his approval and added the stipulations that FP-80 aircraft furnish photo coverage and that a portable photo lab be set up at Lowry AFB, which would be used as a base for the FP-80's.<sup>4</sup> All decisions arrived at in Twelfth Air Force planning were forwarded to the commanding officer of the 38th RCT for his concurrence. Recommendations and requirements for the exercise were then incorporated in a preliminary air plan, which was submitted to Tactical Air Command for final approval. The plan was approved without change, and Tactical Air Command then took the necessary steps to secure the use of Lowry and Peterson and the necessary services for participating Twelfth Air Force units.<sup>5</sup>

D-day for Exercise TIMBERLINE was set at 15 March, with the maneuver scheduled to continue through 19 March. One week before D-day, personnel of the TACP's, along with the air liaison officer, arrived at Camp Carson for special training in the use

of skis and snowshoes. In addition, advance party personnel of the air units were dispatched to the operating bases at Peterson and Lowry to perform liaison duties prior to the arrival of their units. On 13 March, 12 P-80's of the 71st Fighter Squadron arrived at Peterson, and by the same date 4 FP-80's of the 12th Reconnaissance Squadron were in place at Lowry.<sup>6</sup>

Maintenance personnel and supplies had also arrived at the two bases by 13 March. An exception was the supply of JP-1 fuel for the FP-80's at Lowry. This fuel was ordered from a commercial supplier on 1 March. The failure of the supplier to ship promptly delayed its arrival until 17 March, and the 12th Reconnaissance Squadron could not begin operations until 18 March, the fourth day of the five-day maneuver.<sup>7</sup>

Exercise TIMBERLINE was conducted in mountains approximately 10 miles north of Leadville, Colorado, with the 38th RCT maneuvering against the enemy force along a line extending generally east and west from U.S. Highway 24.\* Since it was a primary purpose of the exercise to determine the effectiveness of P-80's in rough, snow-covered, mountainous terrain, all missions were call missions rather than pre-planned. Call missions, it was believed, would provide a more exacting test of fighter-bomber operations under these conditions.<sup>8</sup> Procedure for requesting and controlling air strikes followed prescribed doctrine, although much of the machinery was simulated. Requests from the ground force were forwarded to a skeleton JOC at Colorado Springs, and if the strikes were approved, control was passed from the JOC down to a TACP which vectored the attacking aircraft onto the target in the maneuver area.

Unfortunately, bad weather placed serious limitations on air activity during TIMBERLINE. In the maneuver which covered a period of five days, 15-19 March, fighter-bomber missions were flown only on the afternoon of 16 March. On this day three missions, each employing a four-ship flight called for through the JOC and controlled by TACP's, made dive-bombing and strafing runs against targets in the exercise area.<sup>9</sup>

The late arrival of the 12th Reconnaissance Squadron, combined with the bad weather, made it impossible to furnish any photo coverage during the exercise. One photo-reconnaissance mission was flown on the afternoon of 18 March, but because of the weather no photos could be taken.<sup>10</sup>

It had been contemplated that during the exercise the P-80's would perform one dive-bombing mission, with practice bombs, against targets marked with smoke by the ground troops.<sup>11</sup> In all other missions ordnance was simulated, but the practice bomb mission had been scheduled to demonstrate the accuracy of the P-80 as a dive bomber. Although the mission had to be canceled because of bad weather, on the final day of the exercise, 19 March, a special dive-bombing demonstration was held in the vicinity of Camp Hale, near the maneuver area, for personnel of the 38th RCT.† During this demonstration four flights of five P-80 aircraft each, with each aircraft carrying two 100-pound practice bombs, were dispatched against a panel target. Aircraft were directed to the target by a TACP and by a spotting L-5. Out of 40 bombs aimed at a panel approximately 5 feet wide and 60 feet long, there were 37 direct hits, 2 near misses, and 1 miss. Ground force observers were much impressed by the high percentage of hits and by the performance of the P-80's.<sup>12</sup>

Despite the restrictions imposed by the weather on Air Force participation in TIMBERLINE, the exercise objective of testing P-80 aircraft in mountainous terrain was achieved. In making fighter-bomber attacks, the P-80's experienced no difficulties that could be attributed to this kind of terrain.<sup>13</sup> Contact was made with the TACP's on all missions, proper targets were found, and pilots had no trouble making normal bombing and strafing runs. These results were attained even though the terrain was above the 10,000-foot level, where all areas were snow-covered and where surrounding terrain was extremely rough and conducive to bad air currents.<sup>14</sup>

It was learned also during TIMBERLINE that when spotting aircraft are at high

\*See Appendix 7.

†See Appendix 7

altitude, ground troops and equipment, camouflaged white and traveling on snow-covered surfaces, can be detected only by ski tracks and vehicle tracks. It was discovered, however, that such tracks show up distinctly only if spotting aircraft are operating at an altitude of 8,000 feet or less. On the other hand, it was found that movement of personnel and equipment, even though camouflaged, is discernable by pilots flying at minimum altitude.<sup>15</sup>

Exercise TIMBERLINE also furnished an opportunity to evaluate the functioning of TACP's in snow-covered, mountainous terrain. In this connection attacks on targets of opportunity posed a special problem. It is normal procedure for fighter-bomber aircraft to clear with the TACP before attacking such targets. However, the high mobility of ski troops and the uncertainty of communications between the TACP and aircraft operating at low altitude in mountainous country made it difficult to follow usual procedure. It was frequently found that if after sighting a target of opportunity a pilot had to regain altitude, contact the TACP for clearance, and then return to the attack, the target had disappeared before the attack could be made. Apparently, in order for such attacks to be effective against targets moving swiftly in mountains, some means would have to be devised for cutting down the time consumed in over-target briefing by the TACP.<sup>16</sup>

The principal communications problem of Exercise TIMBERLINE was the difficulty of establishing contact between the ground commander and the TACP; in fact, at no time during the problem could such contact be achieved. To solve this problem, an attempt was made to tie the TACP in with the ground commander by using the infantry's SCR-300 radio. However, it was found that such an arrangement, in mountainous country, is not practical unless numerous relay points are established.<sup>17</sup>

The experience of TIMBERLINE also brought out the need for increasing the mobility of the forward air controller (FAC). In this exercise TACP radios were mounted on Weasels; however, these vehicles could not follow the troops over the

rugged terrain, a circumstance which made it difficult for the FAC either to stay near the ground commander or to reach positions from which he could effectively observe and control air strikes. It was suggested that this problem could be solved if the functions of the FAC's were assigned to ground force ski troops carrying portable VHF radios. This expedient, it was believed, would enable the controllers to maintain contact with the ground commander and to reach vantage points from which they could better observe the targets selected for attack.<sup>18</sup>

Besides engaging in self-criticism following TIMBERLINE, the Air Force participants registered certain complaints against the ground force for the manner in which it had dealt with aspects of the exercise directly related to air. So far as fighter operations were concerned, it was observed that the failure of the 38th RCT to furnish the 71st Fighter Squadron with a continual flow of information on the ground situation made it impossible to maintain current situation maps at squadron level. This deficiency prevented comprehensive premission briefing of fighter pilots and detracted from the realism of the exercise.<sup>19</sup>

More serious was the Air Force criticism of the ground force in matters pertaining to tactical air doctrine. Even before Exercise TIMBERLINE began, the Air Force liaison officer for the maneuver found that in discussions and briefings conducted by ground force officers and dealing with the Air Force role in the exercise, little consideration was given to the proper employment of tactical air power or to the full use of Air Force units taking part in the exercise.<sup>20</sup> Following the exercise the commanding officer of the 1st Fighter Wing, parent organization of the 71st Fighter Squadron, chief Air Force participant in TIMBERLINE, observed that the most obvious shortcoming of the maneuver was the faulty concept of air-ground operations held by personnel of the Mountain Winter Warfare School. He pointed out that although the primary purpose of joint air-ground exercises is to provide training for both air and ground units, there were occasions when Air Force person-



nel were forced to request air missions in order to accomplish any semblance of Air Force training.<sup>21</sup> In this connection it is notable that few of the missions flown by the Air Force in TIMBERLINE were initiated by the ground commander; virtually all missions were flown at the suggestion of either the Air Force liaison officer or the combat operations officer at the JOC.<sup>22</sup>

Violation of basic principles of air-ground operations was also detected by the 67th Reconnaissance Wing, which claimed that its 12th Reconnaissance Squadron was employed during the exercise not as an

independent unit but as an additional arm of the ground forces on terms dictated by the ground forces.<sup>23</sup> The Twelfth Air Force viewpoint concerning these difficulties was somewhat less critical. It pointed out that many of the shortcomings attributed to the ground forces stemmed from the fact that the Army considered TIMBERLINE to be more a ground forces test than a true joint air-ground maneuver. However, Twelfth Air Force made clear its conviction that maximum training for all forces in any exercise can best be achieved by adherence to sound tactical doctrine.<sup>24</sup>

## EXERCISE MESQUITE

The third of the small-scale joint Army-Air Force maneuvers which were conducted during the period 1947-1950 was Exercise MESQUITE,\* held at Camp Hood, Texas, in May 1948, with Tactical Air Command's Twelfth Air Force and the Fourth Army's 2d Armored Division as the main participants. The Air Force purpose in MESQUITE was to provide experience in the technique of furnishing column cover to armored forces in the attack. Special consideration was to be given to visual and photo reconnaissance, and it was expected also that during the exercise new techniques for marking targets with smoke and rockets would be investigated.<sup>1</sup>

Assigned to the exercise by Twelfth Air Force were the 27th Fighter Squadron (JP), the 12th Reconnaissance Squadron, the 47th Bombardment Group (L) Night Attack, and the 933d Signal Battalion Separate (TAC). In addition, three tactical air control parties (TACP) were provided by the 1st Fighter Wing. For the Army the major unit to take part was Combat Command A of the 2d Armored Division.

Preliminary planning for Exercise MESQUITE was accomplished at Camp Hood, Texas, on 11 February 1948 in a conference between representatives of Twelfth Air Force and the 2d Armored Division. At this time it was tentatively decided that the principal ground action would consist of

armored column thrusts by troops of Combat Command A, that a small Aggressor force would probably be employed, and that units of Twelfth Air Force would furnish armored column cover and visual and photo reconnaissance.<sup>2</sup>

Based on the discussions at Camp Hood, Twelfth Air Force drew up a preliminary air plan. In making this plan it was necessary, because of the lack of tactical control elements, to assume that Combat Command A would function not as separate task force but would operate on a simulated army or corps front. The tactical air control center (TACC) and the tactical air direction center (TADC) would be simulated, and tactical air operations would be restricted solely to missions that could be controlled by the TACP's working with the armored columns. During the exercise it was to be assumed that a simulated TACC would turn flights over to the TACP's for control.<sup>3</sup>

The preliminary air plan, which set forth the general plan of air employment, types of missions to be flown, the communications plan, and the supply and transportation plan, was submitted by Twelfth Air Force to Headquarters, Tactical Air Command for approval. After the plan had been approved, another conference was held between Twelfth Air Force and 2d Armored Division staff members to work out further details, particularly matters pertaining to communications.<sup>4</sup> In April, Twelfth Air Force notified the 2d Armored Division that six A-26 aircraft would be furnished to perform missions simulating Aggressor air attacks on friendly ground forces, but that

\*During this period the Air Force also took part in Exercise WANDERER, held in June 1950 to test the defenses of the Soo Locks in upper Michigan. Since it involved only minor Air Force participation—4 C-119's, used to airlift 61 Army military police from O'Hare Field, Illinois to Kinross Field, Michigan, and 12 F-80's, employed in attacks against the locks—WANDERER was not deemed important enough to receive treatment in this study.

because no air-warning net would be available, all such missions would have to be pre-scheduled through the JOC. Twelfth Air Force indicated also that during the exercise it desired that its units drop 200 practice bombs and suggested that details relative to the scheduling of these missions be worked out between representatives of the 2d Armored Division, JOC personnel, and the air liaison officer. The 2d Armored Division was also informed that all Air Force units taking part in the exercise would be based at Bergstrom AFB, Austin, Texas.<sup>5</sup>

D-day for Exercise MESQUITE was set at 10 May. Movement of Air Force units began on 1 May, when the 933d Signal Battalion left March AFB, California, in four C-47's, arriving at Bergstrom AFB the same day.<sup>6</sup> By 3 May personnel, supplies, and equipment of the 12th Reconnaissance Squadron had been airlifted to the maneuver base, and by the following day the squadron's FP-80's were also in place.<sup>7</sup> Next to arrive were the 20 P-80's of the 27th Fighter Squadron, which reached Bergstrom on 6 May. The movement of Air Force units was completed on 10 May with the arrival of seven A-26's of the 47th Bombardment Group (L) Night Attack from Biggs AFB, El Paso, Texas.<sup>8</sup>

Exercise MESQUITE was based upon a situation in which it was assumed that an Aggressor force, operating from Caribbean bases, had invaded the continental United States. After beachheads had been established on the Texas coast of the Gulf of Mexico, in the Galveston-Corpus Christi area, a reinforced Aggressor task force had pushed rapidly inland and captured Camp Hood. While other United States forces were attacking the beachhead, the 2d Armored Division pushed across the communications lines of the Aggressor task force and isolated it in the area of the Camp Hood Military Reservation.<sup>9</sup>

Having been cut off from the beachhead, the Aggressor task force withdrew from Camp Hood proper into the northern part of the Camp Hood Military Reservation, taking up strong defensive positions immediately north of Cowhouse Creek.\* The isolated Ag-

gressor force was being supported by a squadron of A-26's, operating from bases in the Galveston area.<sup>10</sup> It was planned that the 2d Armored Division, located at Mayberry Park, would launch an attack between 10 and 15 May, along a line north of Mayberry Park, the objective being the seizure of enemy positions within the Camp Hood reservation. The division would then regroup and prepare to continue the attack.<sup>11</sup>

At 1000 hours, 10 May, Combat Command A of the 2d Armored Division jumped off from an assembly area just south of Cowhouse Creek. By 1030 hours advance elements had crossed Cowhouse Creek between Cowhouse Crossing and Mason Crossing. Combat Command A continued its drive north along Sugar Loaf Road and then shifted its attack toward the high ground between Robinette and Wolf Points. Here, during the afternoon of D-day, the advance was slowed by stiffening Aggressor resistance, but by late afternoon elements of the command were attacking the Aggressor on the high ground near Round Mountain and Robinette Point. By 1737 hours Aggressor defense of this terrain had been smashed, and by the close of the day's operations, Combat Command A had advanced north along Range Road (East) to a point just beyond the intersection of Range Road (East) and Ruth Road.

On D plus 1 all operations were suspended because of bad weather, but exercises similar to that conducted on D-day were held on D plus 2, D plus 3, and D plus 4, when Exercise MESQUITE was concluded. Although there was some variation, each of these one-day maneuvers involved an attack across Cowhouse Creek and the conquest of approximately the same ground taken on D-day.

The D plus 3 exercise, however, is worthy of special note, for during the day's operations the armored force covered a considerable portion of the road net in the maneuver area, a move that was especially well suited to provide for air and ground forces alike experience in column-cover operations. After crossing Cowhouse Creek, between Cowhouse Crossing and Mason

\*See Appendix 8

Crossing, the armored column attacked north on Range Road (East) to Owl Creek Road, west along Owl Creek Road to Range Road (West), south on Range Road (West) to Brown's Creek Road; west along Brown's Creek Road to Georgetown Road; and south on Georgetown Road to Jackson Crossing at Cowhouse Creek.\*

During the period of Exercise MESQUITE, it was the mission of the Air Force units to cooperate with the ground force by attacking enemy positions in the objective area, particularly fortified gun positions, to attack enemy forces and positions immediately ahead of the advancing armored columns, to provide visual and photo reconnaissance, and to perform artillery adjustment.<sup>12</sup>

The first Air Force unit to go into action during MESQUITE was the 12th Reconnaissance Squadron. From 5 May to 10 May the reconnaissance flight of six FP-80's provided visual and photographic coverage of the entire maneuver area. During this period 85 per cent of the enemy positions in the Aggressor area were plotted by reconnaissance pilots, photographic coverage was complete, and prints developed in a portable laboratory were delivered in time for use by the various air and ground units. From 10 through 14 May, the period of the ground maneuver, the reconnaissance flight furnished visual and photographic coverage and artillery adjustment as directed by the JOC.<sup>13</sup> From 5 through 14 May the reconnaissance flight flew a total of 56 sorties, and the photographic laboratory processed a total of 1,730 negatives and 2,414 prints.<sup>14</sup>

The 27th Fighter Squadron began operations on 10 May, and throughout the exercise performed dive-bombing, glide-bombing, and strafing missions, while providing cover for the armored columns and while making attacks against enemy fortifications. During these missions, targets were usually marked by artillery, mortar, or tank fire.<sup>15</sup> In the course of the exercise the 27th Fighter Squadron flew a total of 259 sorties; strafing was simulated, but in the 49 dive-bombing and 34 glide-bombing sorties

flown, 166 practice bombs were actually dropped.<sup>16</sup>

Functioning as Aggressor air in Exercise MESQUITE was a seven-ship flight of A-26's from the 47th Bombardment Group (L) Night Attack. Missions flown by this flight included simulated strafing, rocket firing, and parafrag drops, flown at low altitude, with tanks and mechanized equipment as targets. Each night a flare force, consisting of three aircraft, took off to locate ground concentrations and to harass troops.<sup>17</sup>

Throughout the maneuver air-ground operations were directed by the JOC at Camp Hood. Control of close-support missions was exercised by three TACP's, equipped with AN/VRC-1 radios mounted on ¼-ton 4x4 vehicles. These TACP's accompanied the armored columns and controlled fighter-bomber attacks on targets immediately in advance of the armored columns.<sup>18</sup> Aircraft were also controlled by an airborne forward air controller, or tactical air coordinator, in an L-5.<sup>19</sup>

Two-way communications between the Twelfth Air Force detachment at Camp Hood and the operating base at Bergstrom Air Force Base were maintained by the 933d Signal Battalion by means of SCR-399 radio. In addition, the battalion installed direction-finding facilities at Camp Hood for the purpose of directing aircraft to the Camp Hood airstrip, which was used as an emergency landing field during the exercise.<sup>20</sup>

One of the primary purposes of Exercise MESQUITE was to furnish experience in column-cover operations in cooperation with an armored column in the attack. As a result of the exercise certain significant conclusions were drawn concerning this technique. The experience of MESQUITE made it quite apparent that an outstanding problem with respect to support of armor by jet fighter-bombers is the location of the operating fighter base. It was found that the distance of 65 miles from Bergstrom Air Force Base to the maneuver area allowed the P-80's only a limited time over their targets. Under these conditions there was an obvious need for conserving fuel. The best results, in this regard, were secured by

\*See Appendix 8

maintaining a power setting of 88 per cent, which was considered the minimum setting for a combat situation and allowed 25 minutes over the target area.<sup>21</sup> It should be pointed out, however, that in Exercise MESQUITE the armored columns did not move long distances each day; movement was restricted to the relatively narrow confines of a part of the Camp Hood reservation. The necessity for providing jet fighter-bomber cover for armor moving over long distances, a situation that would greatly magnify the fuel problem, did not arise during this exercise. Unfortunately, this important aspect of column-cover operations was not explored.

Dive-bombing and glide-bombing missions flown by the 27th Fighter Group were uniformly satisfactory. On one occasion a road block to be dive-bombed was marked by a smoke-shell; within 45 seconds after the shell exploded, an entire flight of P-80's had completed bombing the target, and all bombs struck within a radius of 30 feet of the center of the intersection.<sup>22</sup>

The marking of targets during MESQUITE was accomplished by artillery, mortar, or tank fire. In one instance considerable difficulty was experienced in designating a target by use of artillery. The artillery was slow in adjusting its fire on the target, and six P-80's were kept hovering over the area for an hour, waiting for the target to be marked. One forward air controller (FAC) suggested that the target could have been marked by a tank, firing directly on the objective. This method, however, is not the final answer to the problem of marking targets, since many targets—targets on the reverse slopes of hills, for example—cannot be marked accurately by flat-trajectory tank weapons. The 27th Fighter Squadron pointed out that the assignment of alternate targets to fighter aircraft would at least solve the problem of tying up aircraft when primary targets could not be promptly designated.<sup>23</sup>

As a result of its participation in Exercise MESQUITE, it was possible for the 27th Fighter Squadron to draw some conclusions regarding the capabilities of the P-80 aircraft. The high air speed of the P-80

made possible a prompt response to scramble missions. However, high air speed was also found to have its disadvantages, especially during strafing missions. It was the experience of 27th Squadron pilots that except for snap shooting it was not possible to select and attack targets accurately when the P-80 was flying at high speed and at low altitude.<sup>24</sup>

The problem of control of air strikes also received a share of attention following the exercise. Close-support attacks were controlled by FAC's, using jeep-mounted AN/VRC-1 radios. Although the work of the controllers was generally effective, there appears to have been some misunderstanding as to their proper function. During Exercise MESQUITE there were occasions when requests for air strikes were made by the FAC's. According to prescribed procedure, however, the FAC is a controlling rather than a requesting agency. Requests for air strikes should be made by the ground commander to the JOC by means of a ground force communications net. There were also instances during MESQUITE when controllers not only requested missions but also attempted to stipulate the number of aircraft and the type of bombs to be used, whereas decisions on these matters are properly a function of the JOC. Failure to follow normal procedures in these respects was bound to cause confusion and emphasize the difficulties that usually result when sound and tested principles are violated.<sup>25</sup>

In Exercise MESQUITE controllers were, of course, working with an armored column, directing air strikes in the path of the advance. Controllers operated from their radio jeeps, but it was believed that better results could have been attained by locating at least one controller in a tank, and preferably with or near the artillery forward observer. To avoid drawing enemy fire, this tank, it was emphasized, should be identical to the other tanks of the armored unit, even to similarity of radio antenna. Liaison between the S-3 of the armored combat command and the FAC could be maintained by means of the ground net radio in the controller's tank, thus making it possible to keep the controller informed as to

the targets selected for air attack and the number of aircraft requested.<sup>26</sup>

Control of close support missions in MESQUITE was also exercised by a tactical air coordinator, airborne in an L-5. The officer performing this function found it difficult, when operating directly over the front lines, to correct an attacking aircraft's line of flight in on the target. However, it was his opinion that in those instances where targets were too far in advance of the armored column to be observed from the ground, the airborne coordinator was a distinct asset. The coordinator could pinpoint the target on a grid map and pass this information directly to the attacking aircraft. In addition, he could help orient the attackers by giving them an air picture of the target, including information as to hills, wooded areas, and outstanding landmarks.<sup>27</sup>

The tactical air coordinator, it was noted, could also render valuable assistance in the marking of deep targets with smoke. Since the L-5 pilot is an artillery forward observer, with direct communications to the artillery battalion, he can zero the artillery in on the target and inform the coordinator in the back seat when he is ready to mark with smoke. The coordinator, in turn, can notify the attacking aircraft that smoke is on the way; in the event the smoke is not directly on the target, the coordinator can then talk the pilots onto the target, using the smoke as a reference point.<sup>28</sup>

In addition to the lessons learned as a result of the 27th Fighter Squadron's participation in MESQUITE, certain important conclusions were drawn relative to the conduct of visual and photo reconnaissance by high speed jet aircraft. As a result of the exercise it was possible to conclude that high speed visual reconnaissance is practical. Pilots of the 12th Reconnaissance Squadron were able to locate visually over 85 per cent of the Aggressor targets, a performance the ground forces considered "phenomenal," in light of the high speeds at which the missions were flown.<sup>29</sup> During this exercise it was found that even small camouflaged vehicles could be located by pilots flying at air speeds of approximately 500 miles per hour. In finding targets, the

variable factor was believed to be altitude rather than air speed; to locate small vehicles, pilots might have to fly as low as 500 feet, while marshalling yards, for example, could be observed from an altitude of 15,000 feet. The point was made, however, that both of these types of targets could be picked out by jet aircraft flying at 500 miles per hour.<sup>30</sup>

Commenting on the photo-reconnaissance missions it had performed during the exercise, the 12 Reconnaissance Squadron noted that pinpoint photography at high altitude, for which the FP-80 was designed, was neglected during MESQUITE. In addition, the speed of the FP-80 could not be used during photographic missions because most of the missions requested by the JOC called for large-scale photography. To produce photos of scale 1:5,000 or larger, the speed of the FP-80's had to be reduced, since maximum performance speeds would have resulted in blurred negatives. Moreover, in order to provide large-scale photos, the missions had to be flown at low altitudes. So far as the 12th Reconnaissance Squadron was concerned, these factors detracted from the realism of the exercise, since low-speed, low-altitude photography missions could hardly be flown in actual combat without prohibitive losses.<sup>31</sup>

On a few occasions during the course of the exercise the 12th Reconnaissance Squadron was called upon to perform night reconnaissance missions. It was determined that such missions could not be flown effectively in the FP-80 aircraft because of its high speed and inadequate night-search equipment. It was suggested also that reconnaissance aircraft should be provided a radio channel separate from that used for controlling fighter aircraft. In certain instances during MESQUITE reconnaissance information could not be reported immediately to the TACP's because the single channel being used by both fighter and reconnaissance aircraft was already in use.<sup>32</sup>

It seemed to the 67th Reconnaissance Group, parent organization of the 12th Reconnaissance Squadron, that Exercise MESQUITE demonstrated the need for designing an efficient and easily transportable

means of processing aerial film on the spot, in order to keep abreast of the high speed of jet aircraft. As a solution to this problem it was recommended that consideration be given the possibility of using the detachable fuselage, or pack, of the XC-120\* as a photographic laboratory. This pack could be flown to a forward landing field, reconnaissance aircraft could land at this field, and their photos could be developed and plotted immediately to determine if proper coverage had been obtained. If additional coverage had to be flown, the aircraft could do so without the necessity for returning to their home base. Such an arrangement, it was believed, would result in an important saving in time and fuel.<sup>33</sup>

Besides furnishing visual and photo reconnaissance during Exercise MESQUITE, the 12th Reconnaissance Squadron assisted the ground forces by flying several artillery-adjustment missions. These missions were uniformly successful,<sup>34</sup> and following the maneuver the artillery commander stated that the artillery adjustment performed by reconnaissance pilots was superior to that accomplished by the artillery forward observers.<sup>35</sup>

Turning to the problem of communications during Exercise MESQUITE, it appears that the major communications difficulties stemmed from the shortcomings of the radio and vehicular equipment used by the TACP's. Radio set SCR-522, a component of the AN/VRC-1 used by the TACP's, proved unreliable. The recommended solution to this problem was that the SCR-522 should be replaced by the newer radio set AN/ARC-3.<sup>36</sup>

From the experience gained in MESQUITE it was also possible to gauge the performance of the ¼-ton 4x4 vehicle (jeep)

on which the air-ground communications equipment was mounted, particularly the performance of this vehicle while operating with an armored unit. This vehicle was found to be underpowered, and it was unable to keep pace with tanks and weapons carriers. Moreover, the vehicle proved to be too light for rough terrain, and its springs flexed to a dangerous degree when the vehicle moved over rough ground. In addition, the location of radio antennas made it extremely difficult to maneuver under tree limbs and other obstacles. Much of the malfunctioning of radio equipment during the exercise could be attributed to the various deficiencies of this vehicle. Installation of overload springs and oversized tires (760-16), it was believed, would make possible greater speed as well as smoother riding for both equipment and personnel.<sup>37</sup>

Summing up the results of Exercise MESQUITE, Twelfth Air Force had few complaints to register. There was a need, it believed, for devising a simple request form to be used by ground force agencies when requesting close-support missions. A further criticism was that the realism of the exercise had suffered somewhat from the necessity for merely simulating the tactical air control center and the tactical air direction center. All in all, however, Twelfth Air Force believed that the exercise had provided valuable training for personnel who had taken part in the planning of the exercise and in the exercise itself. There had been a high degree of cooperation between the services, and key personnel of the 2d Armored Division seemed to grasp the principles underlying tactical air operations. Furthermore, Exercise MESQUITE had afforded Twelfth Air Force the opportunity for training certain of its own officers and airmen previously unversed in air-ground operations.<sup>38</sup>

\*For additional information concerning the XC-120 see above, p 24n

## CONCLUSIONS

Throughout the foregoing analysis of Joint Army-Air Force training exercises a definite pattern has been followed. For each of these exercises the objectives have been set forth, the participating units have been listed, steps in planning have been traced, and the conduct of the exercise proper has been described. In this latter regard attention has been fixed first upon the hypothetical situation which furnished a vehicle for the play of the exercise, then upon the play of the exercise, and finally upon the various roles of the Air Force participants.

The treatment of these aspects has been narrative rather than critical. Space has been devoted to these particulars in order to provide the reader with the orientation or background necessary to an understanding of what is the prime purpose of this study—a detailed examination of findings or results. The eight training exercises with which this study has been concerned have offered for analysis a wide variety of tactical air activity, including close-support, interdiction, air-superiority, troop-carrier, resupply, and reconnaissance operations. In Exercises ASSEMBLY, SWARMER, YUKON, and SNOWDROP the troop carrier role was dominant, in Exercise TARHEEL troop-carrier operations were of lesser, but still significant, importance. ASSEMBLY and SWARMER provided troop-carrier units with training in the technique of establishing and maintaining an airhead; YUKON and SNOWDROP furnished experience in troop-carrier operations under cold-weather conditions. More limited in scope, Exercises

TIMBERLINE and MESQUITE were designed to test certain narrow aspects of air-ground operations. TIMBERLINE was conducted largely for the purpose of determining the suitability of the P-80 for fighter-bomber attacks on targets above the 10,000-foot level in mountainous terrain. MESQUITE was intended to explore the problem of furnishing column cover to an armored column in the attack.

For each of the eight exercises this study has sought to examine the various Air Force activities and functions with a view to determining the effectiveness of the Air Force performance, giving credit where credit was due and assessing also mistakes and deficiencies. Much of the material has been drawn from the final reports of the exercises, where final reports have been written, and from the exercise critiques. But an attempt has also been made to dig deeper, to present, in addition to the big picture as seen from the upper levels of command, a view of each exercise from the standpoint of the smaller participating units.

In summarizing the results of these training exercises it is difficult to make generalizations applicable to all. However, certain over-all conclusions seem warranted. Troop-carrier operations, involving dropping of paratroops during Exercises ASSEMBLY, TARHEEL, SNOWDROP, and SWARMER and airlift of troops, supplies, and equipment in all of the exercises except TIMBERLINE and MESQUITE, were the most successful of all the tactical air operations. Troop carrier performance, on the whole, was subjected to only minor criti-



cism. Airdrops were generally accurate. Airlift of troops and resupply by air were carried out according to schedule, although the strategic airlift conducted during Exercise SWARMER seems to have maintained its schedule only by ignoring Aggressor attacks on the airlift bases, attacks that in combat would have seriously upset the flow of men and supplies to the airhead.

The results of close-support operations present a somewhat different picture. On the surface, at least, the close support furnished by the Air Force appears to have been no less satisfactory than troop carrier support. Certainly the ground forces found little to criticize in this regard; indeed, after a number of the exercises ground officers were enthusiastic in their praise of the quality and quantity of close support rendered.\* After the outbreak of the Korean War some Army spokesmen were sharply critical of Air Force close support, comparing it unfavorably with the close support furnished the Marines by their organic aviation. Little if any Army criticism was directed at Air Force close support during the joint training exercises included in this study.

However, the Air Force itself was far from satisfied with certain aspects of close-support operations during these exercises. The most serious deficiencies were those which lay within the tactical air control system—the complex machinery designed to provide for control of tactical air operations. Here, the most common complaints were those leveled at the performance of the tactical air control parties, particularly the work of the forward air controllers. The forward air controllers (FAC) too frequently gave evidence of lack of sufficient training and experience in the technique of controlling air strikes. There were a number of occasions also when FAC's, contrary to established procedure, requested air strikes, a function that is properly a ground force responsibility.†

Directly affecting the performance of the FAC's and affecting tactical air operations generally were the deficiencies in communi-

cations which plagued so many of these exercises. The jeep-mounted AN/VRC-1 ground radio used by the FAC's proved undependable and too fragile to be transported over rough terrain. In a number of the exercises too few VHF channels were allocated to the tactical air effort, and in some instances the attempt to control reconnaissance as well as fighter aircraft on the same channels resulted in further overburdening of communications facilities. Closely related to these deficiencies and contributing to them was the poor radio-telephone procedure and discipline displayed by many of the personnel using these facilities.††

All the communications difficulties that affected the air-ground effort cannot, however, be laid at the door of the Air Force. Although on the one hand deficiencies within the Air Force tactical air control system adversely affected the control of air strikes, on the other hand shortcomings within the Army air-ground operations system upset the procedure for the requesting of air strikes. Such requests are properly initiated by the ground force, and the communications net over which these requests are made is normally furnished by the Army's signal company air-ground liaison. However, in one exercise (SWEETBRIAR) no air request net was provided by the Army, and requests for air strikes had to be passed through Air Force communications channels. In Exercise SWARMER, the last major joint exercise conducted before the Korean War, air-ground operations were seriously hampered by the antiquated communications equipment and inexperienced personnel of the signal company air-ground liaison.†††

Reconnaissance operations also received a major share of criticism following these exercises. It appears that visual and photo reconnaissance were not given the attention their importance warrants. Reconnaissance operations were included in six of the eight exercises considered in this study. In two of these six exercises (TIMBERLINE and SWEETBRIAR) failure to plan carefully

\*See above pp 5, 11, 20, 25

†For discussions of the performance of the tactical air control parties see above, pp 6, 12-13, 25, 29, 48, 51, 59, 64-66

††For analyses of communications deficiencies see above, pp. 6-7, 22-23, 25-26, 28, 30, 39-40, 47-48, 51, 55, 59, 66.

†††See above pp 29-30.

for reconnaissance participation resulted in the late arrival of reconnaissance units, thus seriously hampering the reconnaissance effort. In a third exercise (ASSEMBLY) the photo tech unit, responsible for the printing and processing of aerial photos, was assigned to the exercise almost at the last moment, with the result that the unit received no priority for securing photographic materials until the day before the exercise was concluded. It was a cause for complaint also in Exercises MESQUITE and SWARMER, that reconnaissance units flying RF-80's (designated as FP-80's at the time of MESQUITE) were required to furnish low-speed, low-altitude photography despite the fact that these aircraft were designed for high-altitude, pinpoint photographic missions. The large-scale photography frequently demanded of these units could have been provided in combat only at the strong risk of prohibitive losses. Another example of the misuse of reconnaissance aircraft was the requirement in Exercise MESQUITE that FP-80's perform night-reconnaissance missions, missions for which this aircraft was not equipped nor the pilots trained. On the other hand, in Exercise TARHEEL, RB-26's, unarmed and slow, and equipped for night photo work, were required to fly daylight photo missions, while in this same exercise RF-80's were called upon to carry out close-support and armed-reconnaissance missions.\*

From the above summary of findings it appears that the major deficiencies in these exercises were those that centered around close-support and reconnaissance operations, and around communications. These shortcomings are singled out for attention in this summary because they occurred time and time again during these exercises. Their recurrence is indicative perhaps of their inherent complexity, but it is indicative also of the failure after each exercise to take stock of lessons learned and to strengthen weaknesses by following up these exercises with effective individual and unit training—training aimed specifically

at the correction of deficiencies revealed in the exercises. In addition, it is apparent that with each succeeding exercise there was no conscious effort on the part of planners to examine the experience of the last exercise and to make the correction of its shortcomings an important objective of the next exercise. The follow-up step in the training process is a vital one, and these exercises offer considerable evidence of its neglect.

Underlying this problem of the recurrence of deficiencies is a wide variety of factors. During the period between the end of World War II and the beginning of the Korean war, the Air Force was plagued by rapid turnover of personnel and by serious shortages of trained personnel. It is unlikely that a relatively stable body of trained personnel, large enough to meet its commitments, would have continued making the same or similar mistakes, exercise after exercise.

The condition of the 502d Tactical Control Group during this period is an instructive case in point. It would hardly be valid to attribute all or even most of the responsibility for the problem of the repetition of errors in these exercises to one unit, but certainly part of the answer lies here. Composed of one tactical control squadron and two aircraft control and warning squadrons, this group is assigned the mission of furnishing the air commander with the air surveillance, control, and reporting facilities necessary for the performance of cooperative missions with the ground forces. It has been aptly observed that "the importance of the tactical control group to tactical air operations cannot be over-emphasized, since the tactical control group represents the heart or core of tactical air operations conducted in conjunction with the surface forces."<sup>1</sup>

During the greater part of the period covered in this study, the 502d Tactical Control Group was the only unit of its kind in the Air Force; it was committed to virtually all of the exercises and was responsible for establishing and operating such facilities as tactical air control centers, tactical air direction centers, tactical air control par-

\*For discussions of reconnaissance problems see above pp 7, 14-15, 27-28, 49-50, 58, 60, 65-68

ties, and light-weight radar. Because it furnished these vital elements of the tactical air control system, it was imperative that this group be manned and equipped to perform effectively. Unfortunately, this was not the case. Operation of the unit was seriously handicapped by shortages in skilled personnel. In May 1949, for example, the group had only 61 radio operators (SSN 759) assigned, out of 105 authorized; and of these 61 only 23 were skilled operators. An inspection of the group made at this time revealed that operationally the unit was only 30 per cent effective, and it was concluded that "the personnel shortage of qualified officers and airmen is a paramount problem to this organization and if not corrected in the near future, the 502d Tactical Control Group will be completely inoperational." The report of this inspection stated also that only by borrowing personnel from within the group and from outside organizations was the unit able to meet its commitments in Exercise TARHEEL, held in May 1949; only by the ingenuity and overtime work of a small nucleus of officers and airmen was the unit able to place even one half of its equipment in the field and operate it on an emergency basis.<sup>2</sup>

A year later, when Exercise SWARMER was held, this situation had scarcely improved. During the exercise it was necessary to relieve the commanding officer of the group. Discussing this incident, Maj. Gen. Robert M. Lee, commanding general of Tactical Air Command, pointed out that for over a year and a half this officer had been confronted with almost insuperable obstacles to the carrying out of his assignment. Since the first of January 1949, said General Lee, the various components of the group had not been located together but had been deployed over at least five different stations. Beginning in the last half of 1948, it had steadily lost key and experienced personnel who were transferred to air defense control and warning units. The result was a gradual lowering of the operational efficiency of the group. This condition was repeatedly brought to the attention of higher headquarters, but the only action taken was a reduction of the priority for

the manning of the unit and the assignment of augmentation personnel for limited periods during training exercises. For over a year and a half, General Lee observed, the group's commanding officer had been struggling to provide "some measure of operational effectiveness from a disintegrating unit."<sup>3</sup>

Undoubtedly, other tactical air units were also suffering from a lack of trained personnel, but the condition of the 502d Tactical Control Group, charged as it was with providing so many essential control facilities, is especially significant. As has been indicated above, there was a persistent recurrence of shortcomings within the tactical air control system and in the field of communications during these exercises. These are areas in which the tactical control group is assigned a key role, and the deficiencies within this group may explain, partially at least, the continued existence of the same problems.

A further, and perhaps more fundamental, cause of the reappearance of the same mistakes lies in the Air Force organization that obtained from December 1948 to July 1950, particularly as it pertained to tactical air. In the Air Force reorganization of December 1948, Tactical Air Command (TAC) lost its major command status and was placed under the newly activated Continental Air Command (ConAC). TAC was stripped of its units, and its numbered air force—the Ninth—became one of six regional air forces whose primary mission was the administering and training of Air Force Reserve and Air National Guard forces. TAC became in effect merely an operational and planning headquarters; ConAC would, as the need arose, allocate units of the numbered air forces to TAC for participation in specific training exercises. Later, in April 1949, Tactical Air Force (Provisional) [TAF (Prov.)] was activated to provide TAC with a field operational headquarters for the planning and conduct of maneuvers. It should be stressed that TAC and TAF (Prov.) were operational headquarters only and had no administrative or logistical control over tactical units. Units were placed under their operational control but only for

stated periods during training exercises. This organization remained in effect until July 1950, when TAC was raised to major subordinate command level under ConAC. Ninth Air Force became Ninth Air Force (Tactical); units were definitely assigned to it and it was returned to the direct jurisdiction of TAC.

During the post-World War II period, TAC was caught in a squeeze between a shortage of funds and the higher priorities allocated to strategic air and air defense. TAC was relegated to a tertiary position—a poor last. In addition, it was saddled, after December 1948, with an organizational structure that made effective conduct of training exercises exceedingly difficult. Writing in April 1950, Brig. Gen. W. R. Wolfinbarger, commanding general of TAF (Prov.), claimed that the experience gained in exercises during the "past year" had proven conclusively that the system of augmenting TAF (Prov.) with personnel and units under the administrative and logistical control of the numbered air forces was "costly, inefficient, undependable, and unwieldy." He stated further that sound planning for exercises could not be conducted by independent agencies located hundreds of miles apart. The general believed that the system of temporary augmentation of TAF (Prov.) had resulted in a "reckless waste of training," since "experience gained by augmentation personnel is immediately lost to this headquarters [TAF (Prov.)] and a new group must be indoctrinated, and if possible, trained, whose experience will in turn be lost before the next maneuver."<sup>4</sup>

It would appear that this organizational structure, a structure that remained in force during the latter half of the period covered by this study, sheds considerable light on the problem of the continued existence of the same, or similar, deficiencies in training exercises. This structure made difficult the sound and thorough planning that would have helped to correct these shortcomings. Furthermore, it seems evident that TAC and TAF (Prov.), lacking administrative and logistical control of the tactical units taking part in these exercises, had no direct means of instituting and supervising,

after each exercise, a follow-up training program calculated to correct deficiencies.

Thus far, this discussion of the problem of recurring mistakes has been limited to the period 1947-1950, the period of this study, and some of the obstacles that stood in the way of its solution have been examined. However, this is not a problem peculiar only to this period; it is a continuing problem, one that will persist so long as men are fallible. Although no final or complete solution is possible, there must, if there is to be progress, be a constant effort to alleviate it. Certain steps can be taken to make it less likely that the mistakes of one exercise will be repeated in the next. Some of these steps are perhaps quite obvious and some are already a matter of practice, but mention of them here may serve to emphasize their importance. Exercise reports should be carefully written and should contain full information as to deficiencies as well as recommendations for their correction. Following each exercise there should be a wide distribution and dissemination of these reports, and a careful check should be made to insure that all reports detailing the shortcomings of the exercise actually reach and are examined by the units that had participated. All other tactical air units likely to be engaged in similar exercises or operations in the future should also receive and examine these reports. Wherever possible, each exercise should be followed up immediately with corrective training. Maximum use of exercise reports should be made at all levels of command by those responsible for the preparation and supervision of individual and unit training programs. In addition, planners at all levels should when planning a given exercise examine thoroughly the findings of past exercises and make a determined effort to construct plans aimed at the correction of previous mistakes. Just prior to each exercise it is the usual practice to conduct pre-exercise training. Here, it would seem, is a further opportunity for vigorous action calculated to prevent the reappearance of past deficiencies.

It remains to set forth certain conclusions regarding the concept that governed

virtually all these exercises. In all eight exercises it was assumed that the United States had been attacked by an Aggressor, and each exercise represented action taken to repair a breach in the nation's defenses. These exercises were, then, in a sense defensive; but the action itself, except in Exercise YUKON, was confined to offensive operations, to the almost complete neglect of defensive operations. It would seem that without danger to the offensive spirit, so long a keystone of the American concept of war, one major exercise at least might with profit have been devoted to defensive action. Such an exercise could have afforded the Air Force and the Army valuable experience in conducting air-ground operations during withdrawals or retrograde movements.

Similar experience might also have been provided if the two services had joined in conducting exercises more in the nature of real maneuvers, with free play allowed between forces of approximately equal strength. None of the exercises considered in this study was in a true sense a maneuver. In each case the friendly forces engaged an Aggressor force far inferior in strength on the ground and in the air. The play of each exercise was pre-planned, the action was rigidly controlled, and the victory of

the superior friendly forces was a foregone conclusion. This type of exercise possesses certain advantages; it can be conducted with smaller commitments in personnel and equipment, and by close control of the action and of the Aggressor force, situations can be artificially created to insure the training of small units. On the other hand, the controlled exercise offers less opportunity for commanders and staffs to gain experience in meeting problems that arise naturally and unexpectedly, as they do in combat. Thus the controlled exercise is less realistic than the true maneuver. In the exercises dealt with in this study offensive action was emphasized and defensive action neglected, except for the small Aggressor forces. Victory was guaranteed, the participants did not have to make adjustments and decisions to meet a rapidly changing and uncontrolled situation. Such adjustments and decisions are inherent in combat, and success in combat is largely dependent upon the ability to make them with promptness and wisdom. With the exception of combat itself, this ability is best developed in free-play exercises or maneuvers, and it is regrettable that no joint air-ground exercise of this type was conducted between the close of World War II and the outbreak of the Korean conflict.

NOTES

CHAPTER 1

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- 2 Ltr, Hq 9th AF to CG 12th AF, sub : Letter of Instructions, 22 Mar. 1948, in Hist 9th AF, Vol. IX (20 Mar.-28 May 1948), Pt III, doc. 9
- 3 Hq. Air TF, Final Rpt Exercise ASSEMBLY, 7 June 1948, in Hist 9th AF, Vol. IX (20 Mar -28 May 1948), Pt. III, doc. 28<sup>1</sup>.
- 4 Hist 10th Ren. Gp, Apr -June 1948, p. 23.
5. Hist. 12th Photo Tech Unit, 1 Apr -30 June 1948, p 16
6. Ltr, Hq. TAC to CG 12th AF, sub · Employment of Combat Units, Tactical Air Command, 15 Apr. 1948, in Hist. TAC, 1 Jan -30 Nov 1948, III, doc. 132<sup>F</sup>
- 7 Hq 82d Airborne Div Exercise ASSEMBLY, Operational Publications, Phases I and II, Opn. Plan 2, Annex 1, in Hist 9th AF, Vol IX (20 Mar -28 May 1948), Pt III, doc 25.
- 8 Hist. 9th AF, Vol. IX (20 Mar -28 May 1948), Pt. III, pp 1-2
- 9 Hq. 9th AF, General Plan Tng Exercise ASSEMBLY, 23 March 1948, in Hist 9th AF, Vol. IX (20 Mar -28 May 1948), Pt III, doc 10.
- 10 Hq Air TF (ASSEMBLY), Detailed Plan Tng Exercise ASSEMBLY, 15 Apr. 1948, in Hist. 9th AF, Vol IX (20 Mar -28 May 1948), Pt III, doc. 15
- 11 Hist. 9th AF, Vol IX (20 Mar -28 May 1948), Pt III, p 10
12. *Ibid.*, p. 11
- 13 Critique Exercise ASSEMBLY, 28 May 1948, in Hist. 9th AF, Vol. IX (20 Mar.-28 May 1948), Pt III, doc. 28
14. Hq. 9th AF, General Plan Tng Exercise ASSEMBLY, 23 Mar. 1948, in Hist 9th AF, Vol. IX (20 Mar -28 May 1948), Pt III, doc. 10.
15. Hist 9th AF, Vol IX (20 Mar -28 May 1948), Pt. III, p. 8
- 16 *Ibid.*, p 34
17. *Ibid.*, pp 5-7
18. Hq TF Lucky, Intel Plan, 22 Mar 1948, Inc. 1 to Hq 9th AF, General Plan Tng. Exercise ASSEMBLY, 23 Mar 1948, in Hist 9th AF, Vol IX (20 Mar.-28 May 1948), Pt. III, doc 9.
- 19 Critique Exercise ASSEMBLY, 28 May 1948, pp 3-4, in Hist. 9th AF, Vol. IX (20 Mar -28 May 1948), Pt. III, doc. 28.
- 20 *Ibid.*, pp. 5-6.
- 21 Hq Air TF, Final Rpt Exercise ASSEMBLY, 7 June 1948, in Hist. 9th AF, Vol IX (20 Mar -28 May 1948), Pt. III, doc 28<sup>1</sup>.
- 22 *Ibid.*
23. *Ibid.*
24. Hq 502d Tac Con Gp., FO 2, 28 Apr. 1948, in Hist 502d Tac Con Gp, Apr.-June 1948, doc. 1.
25. Hist 9th AF, Vol IX (20 Mar -28 May 1948), Pt III, p. 27
- 26 Hq JTF Lucky, Final Rpt. Exercise ASSEMBLY, 11 June 1948, pp. 1-2.
- 27 Ltr, Hq 62d TC Gp to CO 8th TC Sq., sub · Commendation and Appreciation, 18 May 1948, in Hist 62d TC Gp, 1 Apr -30 June 1948, sup. docs.
- 28 Critique Exercise ASSEMBLY, 28 May 1948, p. 30, in Hist 9th AF, Vol IX (20 Mar -28 May 1948), Pt III, doc 28.
29. Hq. Air TF, Final Rpt Exercise ASSEMBLY, 7 June 1948, in Hist. 9th AF, Vol IX (20 Mar -28 May 1948), Pt III, doc 28<sup>1</sup>
- 30 R&R, A-3 9th AF to Lt Col Stanton and Wg. Cmdr Morrison, sub Standardization and SOP for Airborne and Troop Carrier Missions, 18 May 1948, in Hist 9th AF, Vol XI, 1 July-30 Nov 1948, doc 330
- 31 Hist 9th AF, Vol. XI (1 July-30 Nov. 1949), pp. 308-9
- 32 82d Airborne Div Staff Rpt Exercise ASSEMBLY, 1948, Book II, p. 1.
- 33 *Ibid.*, Book IV, p 33.
- 34 Critique Exercise ASSEMBLY, 28 May 1948, pp. 17-18, in Hist 9th AF, Vol IX (20 Mar -28 May 1948), Pt III, doc 28
35. *Ibid.*
36. *Ibid.*, p 14.
37. J-3 Final Rpt. Exercise ASSEMBLY, p 9, in Hq JTF Lucky, Final Rpt Exercise ASSEMBLY, 11 June 1948, Annex 3.

38. J-3 Final Rpt. Exercise ASSEMBLY, Incl 6, pp 1-2, in Hq. JTF Lucky, Final Rpt Exercise ASSEMBLY, 11 June 1948, Annex 3
39. *Ibid.*, p 3.
40. *Ibid.*, p. 2.
41. Critique Exercise ASSEMBLY, 28 May 1948, pp 14-15, in Hist 9th AF, Vol IX (20 Mar-28 May 1948), Pt III, doc. 28.
42. J-3 Final Rpt Exercise ASSEMBLY, Incl 6, p. 2, in Hq. JTF Lucky, Final Rpt. Exercise ASSEMBLY, 11 June 1948, Annex 3.
43. 82d Airborne Div, Staff Rpt. Exercise ASSEMBLY, 1948, Book III, p. 27.
44. Critique Exercise ASSEMBLY, 28 May 1948, p. 14, in Hist. 9th AF, Vol. IX (20 Mar.-28 May 1948), Pt III, doc 28
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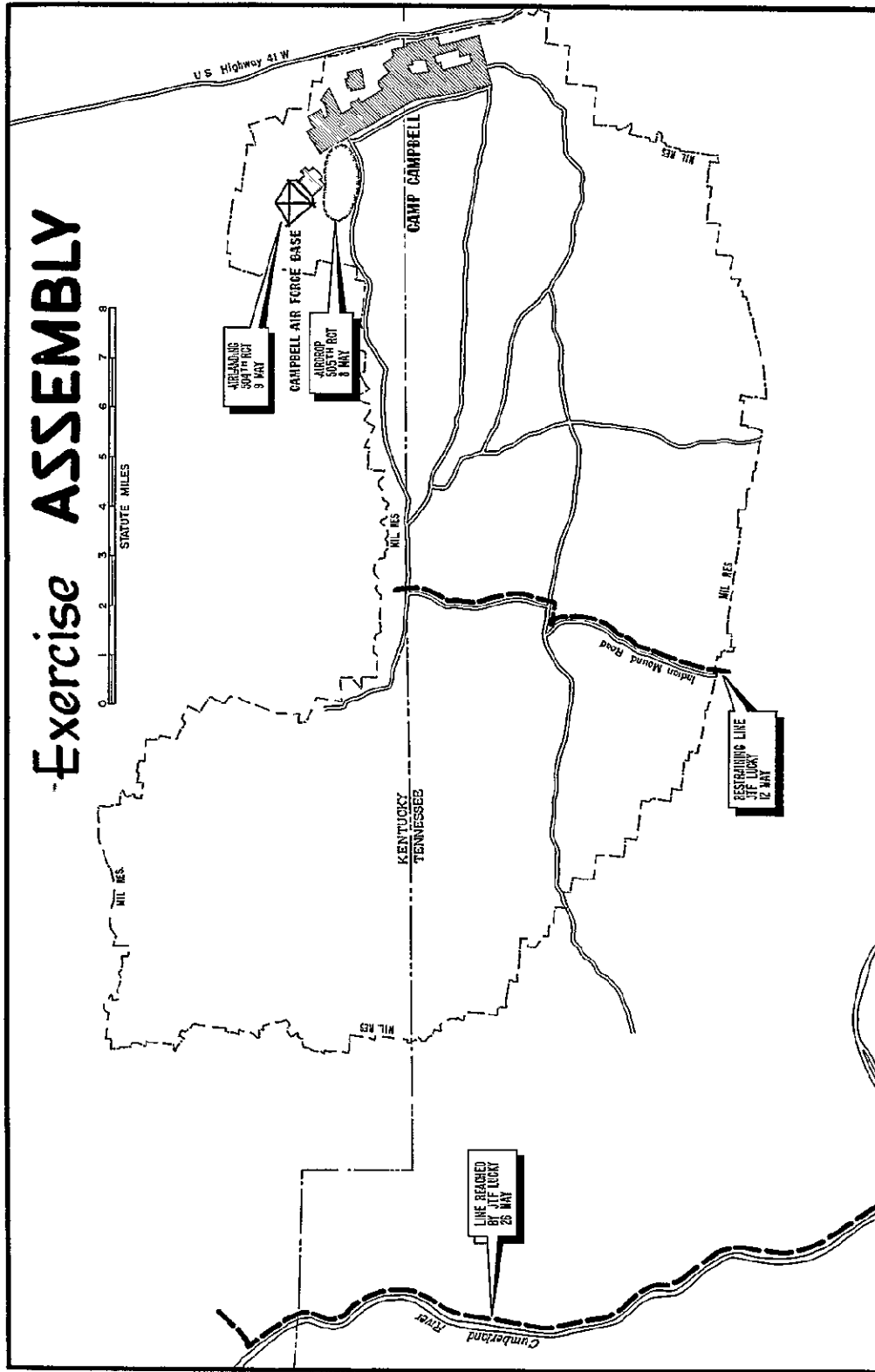
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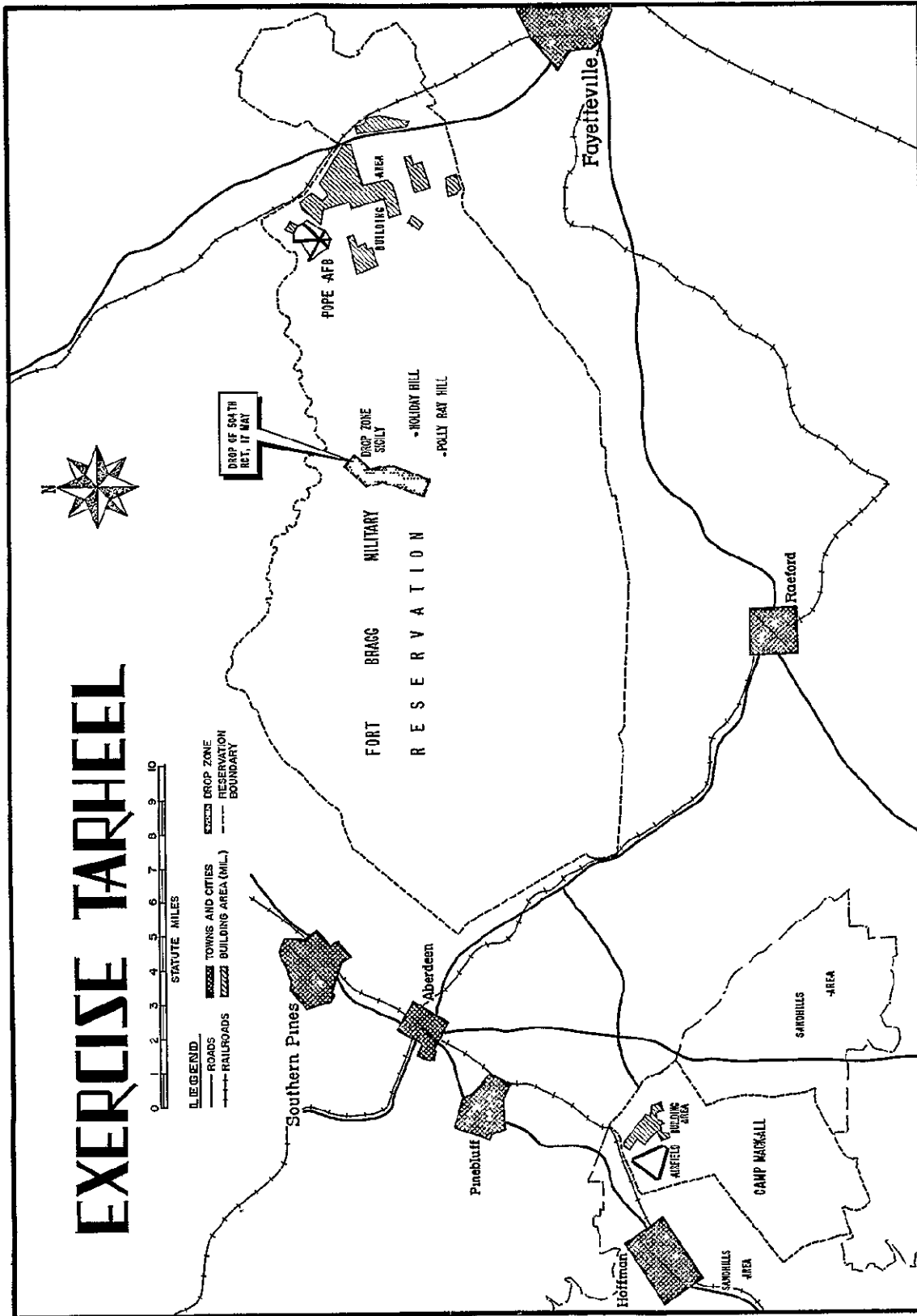
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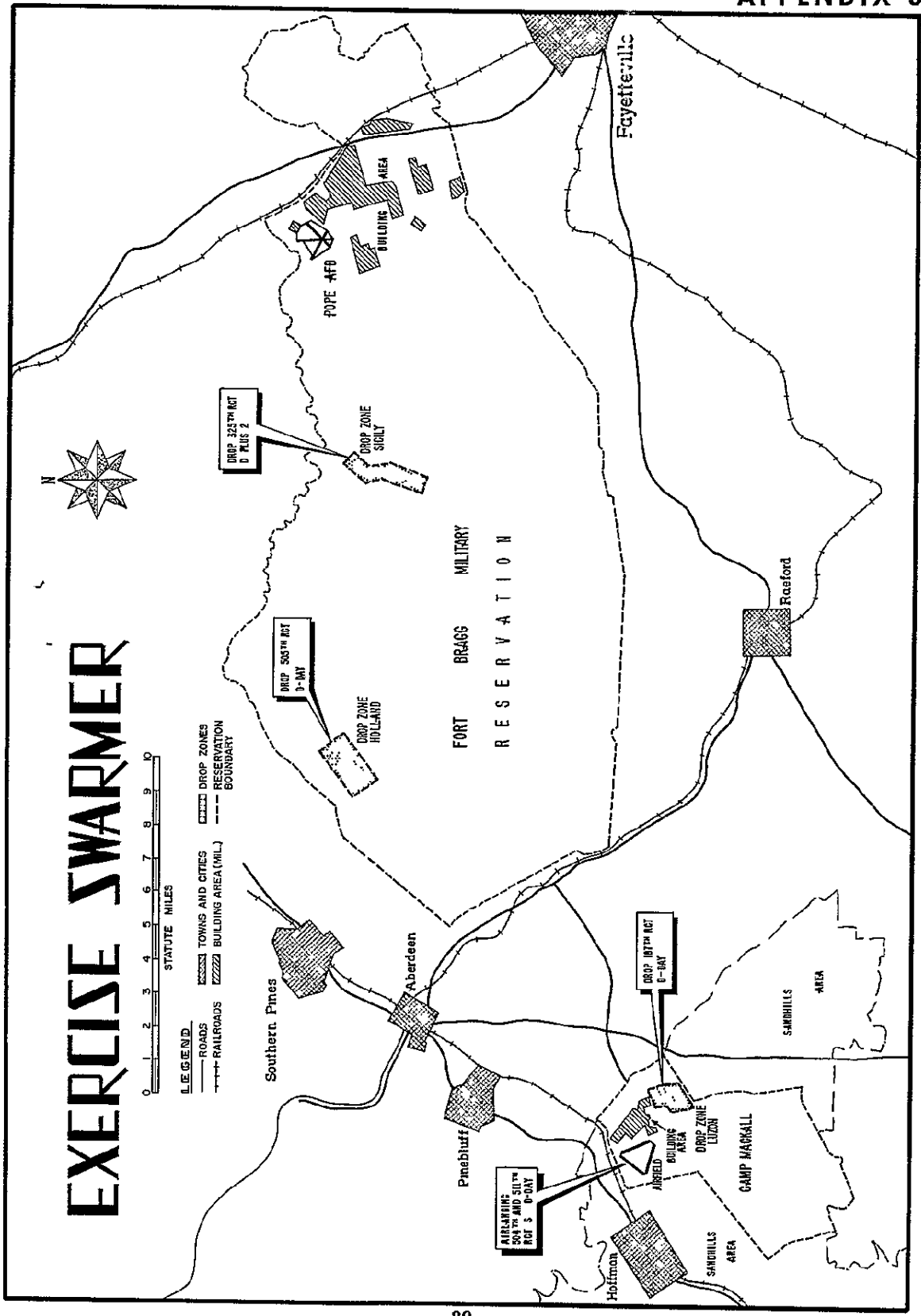
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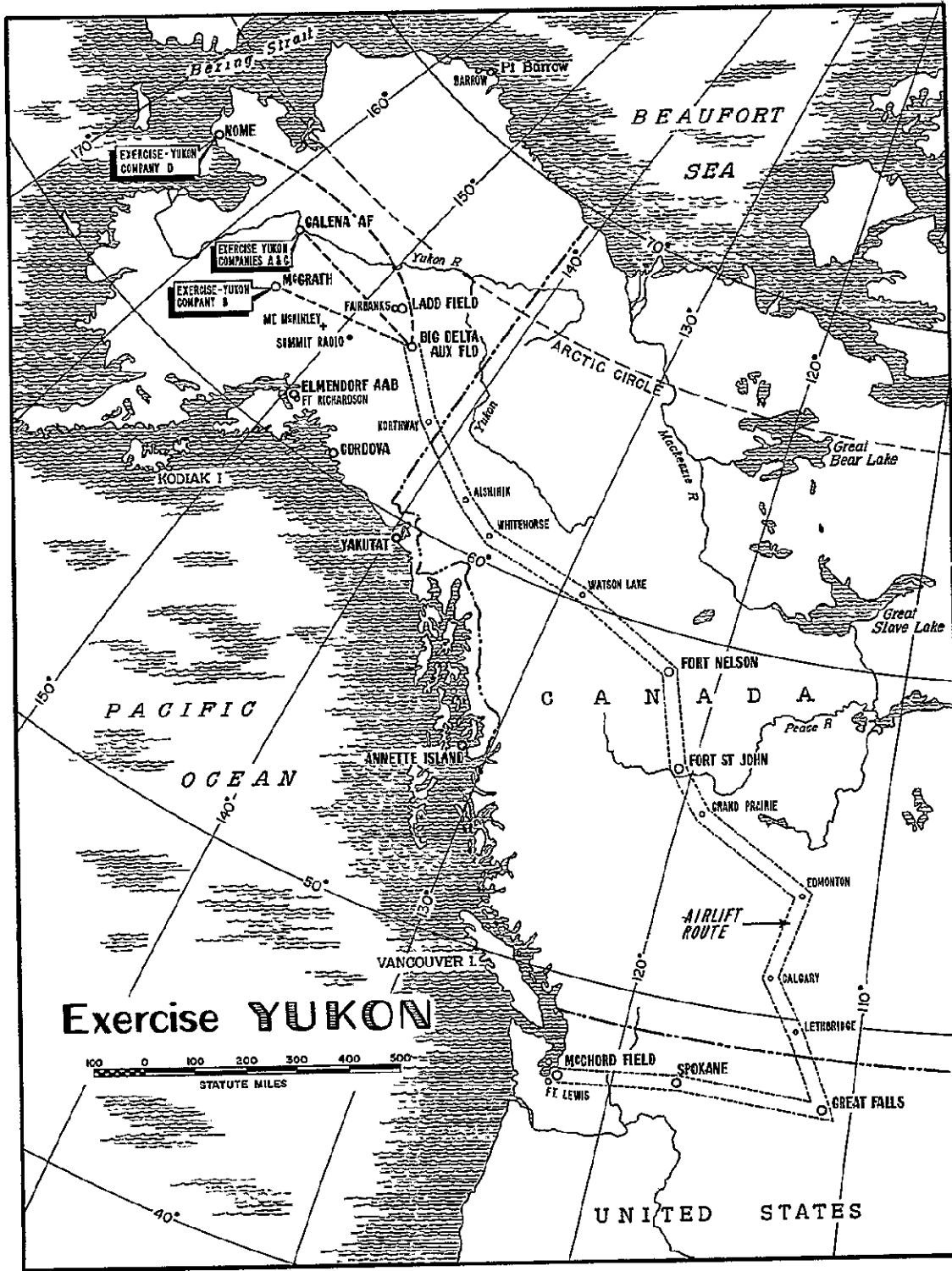


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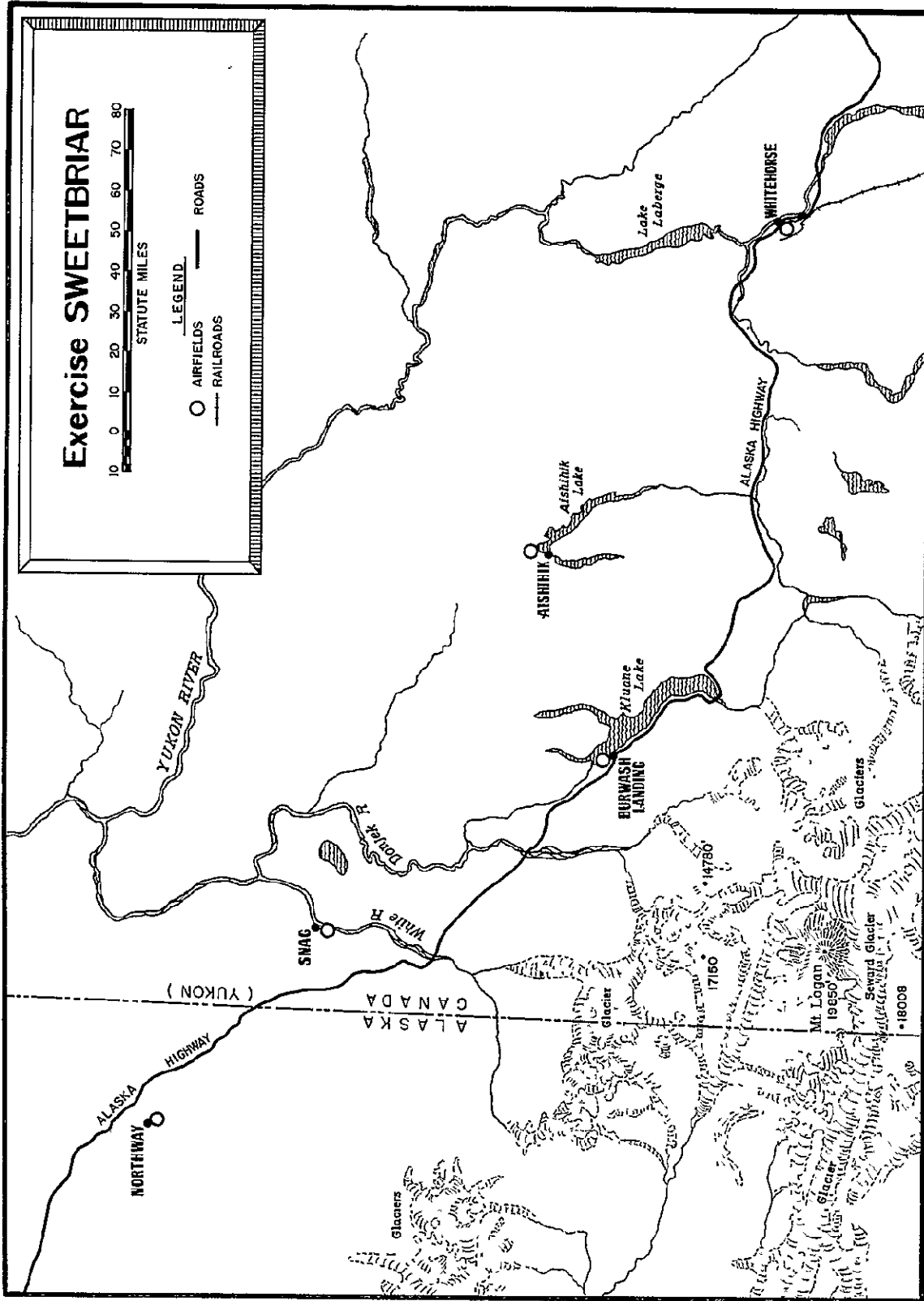




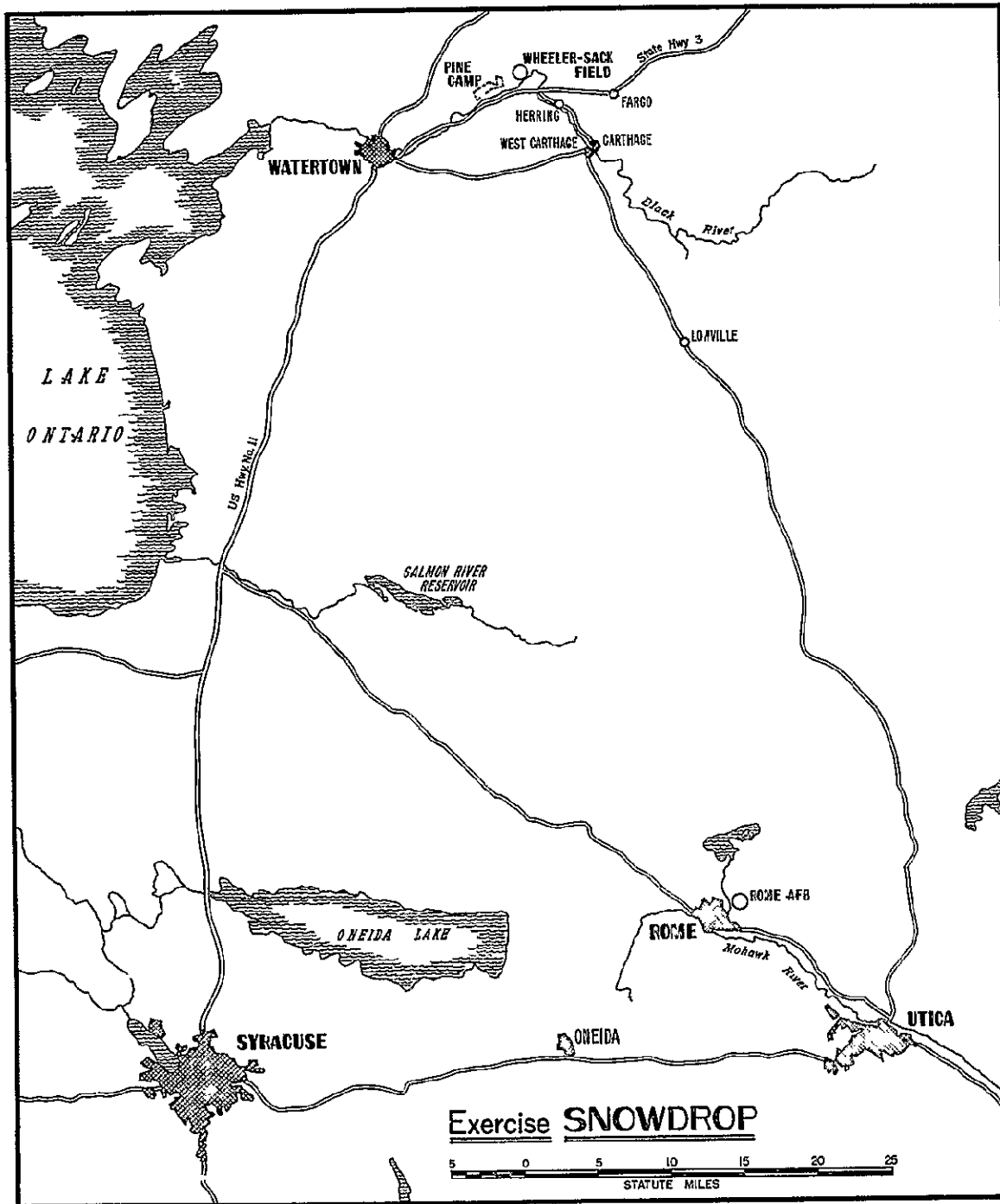
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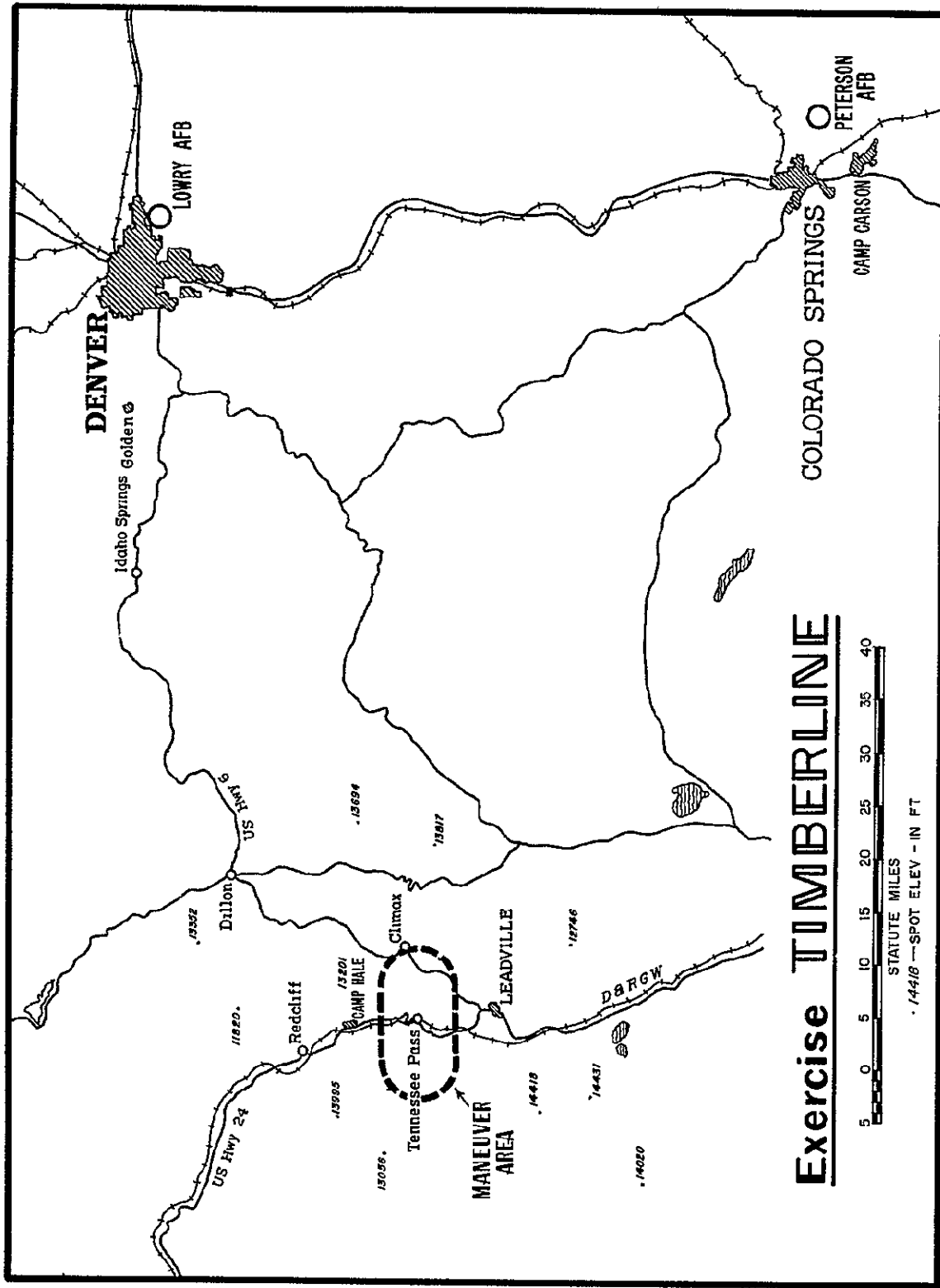


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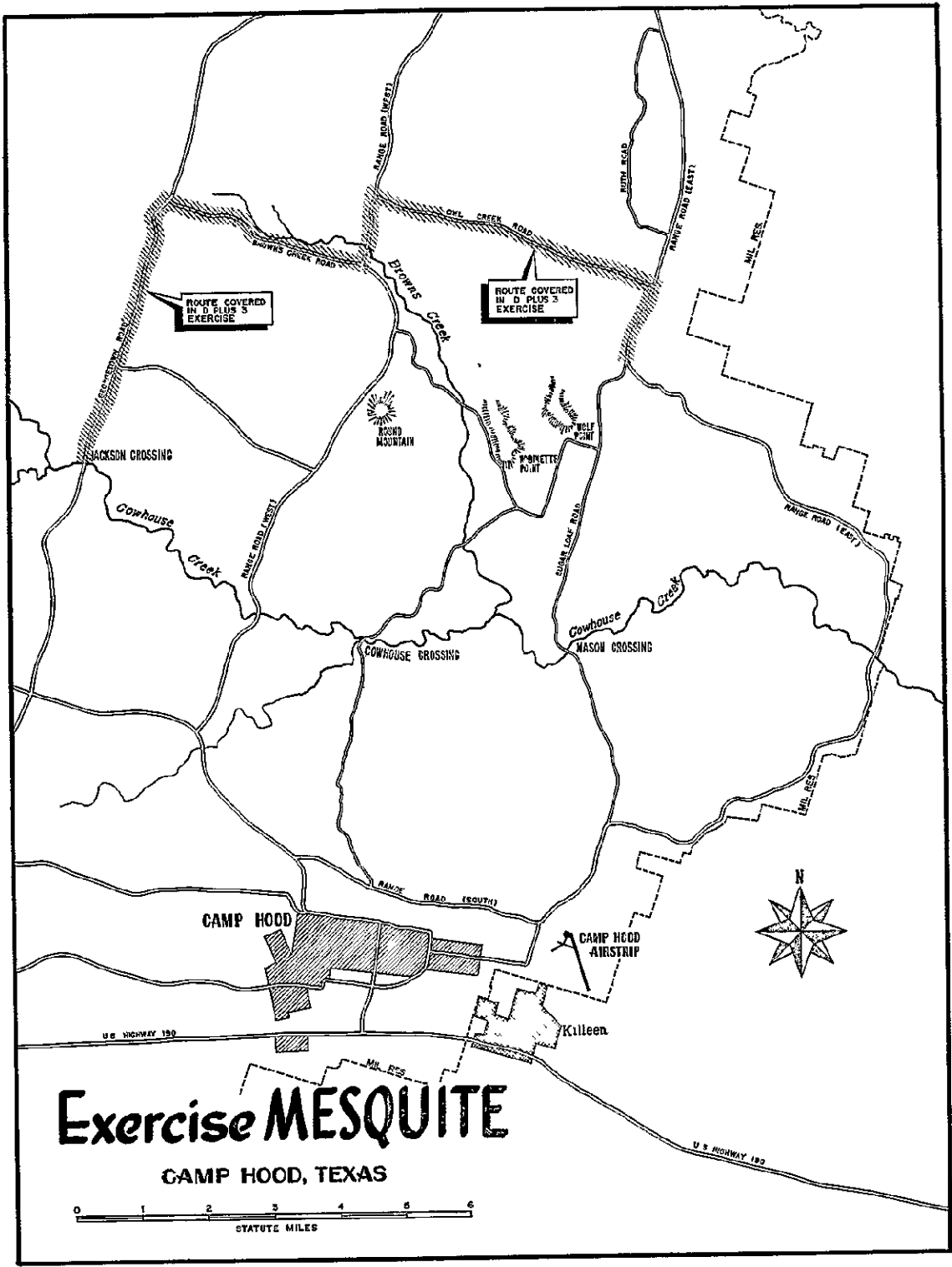




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ran the Japanese escape routes from Rangoon. As April wore on, however, Japanese sabotage and increasingly heavy pre-monsoon rains made forward movement on the ground more and more difficult. For this reason air transport was needed to move ground forces forward if Pegu was to be promptly cleared of Japanese. The Allied advance reached Pyuntaza Airfield, north of Pegu, on 27 April. Engineers protected by an infantry detachment immediately commenced work on the airfield while 17 Division continued its attack on the city. Before dawn of 29 April, the runway was 4,800 feet long and ready for transport landings.

C-47's of the 2d and 4th Combat Cargo Squadrons began flying 9 Indian Brigade and supporting units from Meiktila to Pyuntaza on the morning of 29 April. Fifty-four trips during the day delivered 1,123 men and their weapons, a large quantity of ammunition (including grenades and mines), mess equipment, radio sets including a brigade radio station, and five jeeps. This battalion-size group was sufficient to secure the Pyuntaza area and capture Shwegyin while the main IV Corps effort continued against bitterly resisting Japanese in Pegu. An airstrip was hastily constructed at Payagyi, adjacent to the city, for the receipt of additional reinforcements and supplies. This strip was ready for transports by nightfall of 30 April.

In the meantime the remaining elements of 9 Brigade had moved from Meiktila to Lewe, so that field was the emplaning point for additional reinforcements. The original plans allowed four days for the movement, only 25 C-47's being available. By 30 April, however, the weather had become so bad that it was evident that the use of fair-weather strips could continue only a few more days; it was decided to make every effort to move the rest of 9 Brigade in 48 hours.

By the time the first flight to Pegu took off on 1 May, the strip at Lewe had begun to deteriorate, but the two combat cargo squadrons completed 61 missions, delivering 858 men and 90 tons of equipment. The

weather proved too bad for night flying, and forced a reduction in load on daylight missions; on 2 May 74 missions from Lewe to Payagyi delivered 891 men and 74 tons of equipment. Rain was almost incessant on 2 May, and the third wave of C-47's took off during a violent thunderstorm and in mud up to the wheel hubs. On 3 May Lewe Strip was completely waterlogged. Only two flights took off, and before the day was over it was decided that the remaining troops of 9 Brigade would have to move on to Pegu by road.<sup>37</sup>

CCTF had one more task in the railroad corridor even though the Japanese evacuation of Rangoon and its subsequent occupation from air and sea had marked the success of the Fourteenth Army offensive. Ground forces reached the well-sited strip at Zayatkwinn, 32 miles from Rangoon, on 4 May. Although Tennant Airfield was barely serviceable, C-47's of the 1st Combat Cargo Group and 117 Transport Squadron towed gliders from there to Zayatkwinn on the morning of 5 May. Handicapped by weather as well as by craters in the runway, the engineers made slow progress. When Lewe Airfield became temporarily serviceable on 8 May, eight more equipment-loaded gliders were towed to Zayatkwinn. Momentarily improved weather and the added equipment enabled the engineers to open the strip to C-47's before nightfall on 8 May, and to C-46's on the 9th. Zayatkwinn was the southernmost airfield opened in the IV Corps area during the drive on Rangoon.<sup>38</sup>

During the prolonged fighting about Meiktila, it became evident to Lt. Gen. Sir Oliver Leese, Commander in Chief, Allied Land Forces, Southeast Asia (ALFSEA), that IV Corps might not be able to reach Rangoon before the beginning of the wet monsoon. He knew that if this proved true, and that if the Japanese made a last-ditch stand in Rangoon, the Allied ground forces in Burma would face an almost insoluble supply problem during the rains. He proposed to Mountbatten that a previous plan for an airborne and amphibious attack on Rangoon (DRACULA) be put into effect in

modified form to insure possession of the port before the rains reduced supplies to Fourteenth Army. Because of weather and tides, the operation would have to be carried out before 5 May 1945. The plans were hurriedly modified to meet the new situation, and Mountbatten approved them on 16 April, only 14 days before the landings were scheduled to take place.

These plans provided for an amphibious assault by 26 Indian Division as the main blow at Rangoon, but before the landing craft carrying the assault troops could pass up the Rangoon River, Japanese guns at Elephant Point had to be silenced. The plans provided for heavy aerial bombardment of these guns, but in order to make doubly sure, it was decided to drop a battalion of 50 Parachute Brigade at Elephant Point on 30 April.

Transportation of the paratroop battalion was the responsibility of 317th and 319th Troop Carrier Squadrons, which were withdrawn from operations in central Burma for two weeks of intensive training. Ten C-47's of the 2d and 4th Combat Cargo Squadrons reinforced the Air Commando units. Beginning on 16 April, pilots and crews began training in day and night formation flying at Kalaikunda. The parachute battalion took part in the training after its arrival at Kalaikunda on 19 April. After a number of flights and simulated drops, the whole battalion made a practice jump at dawn on 26 April. This exercise went well, and on 29 April the aircraft, with the paratroopers aboard, were flown to Akyab, from whence the mission against Rangoon would be mounted.

Final briefing was held at 0200 of 30 April, after a B-25 weather plane had reported the weather along the planned route poor but suitable. Two pathfinder planes took off from Akyab at 0230 and dropped their loads on the DZ at 0548. The drop was perfect, and the officers and men on the ground began marking the zone for the main drop. The main serial of transports, 38 strong, took off at 0300 and found the DZ well marked with panels and white smoke. The jump began at 0633. Very little

Japanese opposition was encountered, and all transports returned safely; the only casualties were eight paratroopers who suffered slight injuries in the jump. All told, this first mission dropped 800 paratroopers and 239 packs of supplies and equipment. On 1 May, eight C-47's of the 319th Squadron flew 160 additional paratroopers and some equipment to Elephant Point, and ten C-47's of the 317th Squadron and the combat cargo attachment dropped 29 tons of equipment, mainly weapons and ammunition.

In the meantime, the amphibious expedition bearing 26 Indian Division had swept mines in the channel leading to Rangoon and was proceeding up the river. As related earlier, before the troop-laden landing craft reached the city, they were met by a bomber pilot who had landed at Mingaladon Airfield and who reported that the Japanese had left Rangoon.

Since IV Corps' advance had forced the Japanese to evacuate Rangoon, the air-borne-amphibious operation did not hasten the occupation of the city by more than a week or two at the most (leading elements of IV Corps were only 32 miles from Rangoon on 1 May, with no opposition before them on the road south). On the other hand, the DRACULA operation did hasten the opening of the port. Engineers immediately went to work on the wrecked facilities, and through the use of equipment brought in by sea, quickly had a few slips in operation. By mid-June some 3,000 tons of material per day were being unloaded at Rangoon. Unfortunately, the delivery of supplies from Rangoon to troops in central and southern Burma was still beset with many difficulties, and air supply remained an important, if not the most important, means of supplying the troops facing the Japanese until the end of World War II.<sup>39</sup>

#### Operations during the 1945 Monsoon

By the time the reoccupation of Rangoon had been completed, marking the successful accomplishment of the main objective of the central Burma campaign, the 1945



monsoon rains were in full spate. Accomplishment of the objectives of the campaign did not mean an end to the fighting. In the east large Japanese forces had managed to withdraw across the Sittang River, and they were ready to oppose any Allied troops who crossed that stream. As a result of the confusion created in Japanese ranks by the swift Allied advance, small parties of Japanese were wandering throughout south-central Burma. Since these parties had no intention of surrendering, they were a constant threat to the safety of Allied soldiers, and intensive patrolling was necessary to deal with them. Finally, and most important, the remnants of the Japanese Twenty-eighth Army, plus stragglers from the Fifteenth Army, had been isolated in the Pegu Yomas, the hills that lay between the Irrawaddy River and the Mandalay-Rangoon Railroad. The position of this force was hopeless, but Allied commanders could be sure that the Japanese would try to break out and cross the Sittang River. Thus it would be necessary to fight one more battle in Burma.

Conditions for fighting could hardly have been worse. As the rain poured down day after day, all of south Burma was more or less flooded. Troops moving across country had their choice between wading the waist-deep water and mud in the rice paddies or exposing themselves by walking the balks between paddies. Under such conditions, skirmishes between patrols were a deadly business; men who were wounded might drown before help could reach them. Especially exasperating was the fact that maps became practically useless as water covered natural geographic features.<sup>10</sup>

The rains naturally added to supply troubles. The improvements in the surface LOC from Dimapur to central Burma were to some extent cancelled by the rains, and this route was never able to provide more than a small part of the needs of the troops in Burma. Rangoon, as the port facilities were repaired, did become an entry point for substantial amounts of supplies, but the condition of the roads and railroad leading out of that port made distribution to

all units impossible. Through May 1945, the last month in the life of the integrated CCTF Headquarters, the task of CCTF transports was hardly reduced at all. In fact, when the worsened weather is taken into consideration, air supply facilities were under a greater strain in May than in the immediately preceding months.

As of 1 May 1945, 18 transport squadrons were operating under CCTF control. Two RAF squadrons, 96 and 215, were added during the month, but 96 Squadron operated only 12 days before being withdrawn, and the 12th Combat Cargo Squadron, its task of supplying 36 British Division completed, reverted to Tenth Air Force control on 12 May. The 317th and 319th Troop Carrier Squadrons, based at Asansol and Kalaikunda, had only a small part in CCTF operations in May and left for north Burma before the month ended. By the end of May, only one transport squadron was left on the Imphal Plain and only one at Comilla; the remainder were at Hathazari, Chittagong, Akyab, and Ramree.

The effect of weather and increased distance from the ground units supplied is evident in the fact that total CCTF flying time in May was greater than in March or April (72,441 hours in May, 63,692 in March, 68,164 in April), but tonnage was 6,000 tons under the March total, 8,500 tons under the amount delivered in April. Even so, CCTF units delivered 99.7 percent of the supplies and 98.5 percent of the reinforcements requested by the ground forces. This was possible because the number of transport aircraft assigned to CCTF had risen to a daily average of 438.2, of which 355.7 averaged being operational. The average flying time per assigned transport for the month was only 165.36 hours.<sup>11</sup>

With the breakup of CCTF Headquarters soon after 1 June 1945 and the gradual withdrawal of American units from India-Burma operations, the scale of air supply in central and southern Burma was necessarily reduced. The tonnage delivered in June was about half that carried in May. This was not entirely due to a decline in

ground force needs, and ALFSEA Headquarters complained early in the month that supplies received were 100 tons per day less than the troops in Burma needed. This shortage was in part the fault of the ground forces (if fault there was) because it had been planned to evacuate some units, and the evacuation had not been carried out. To some extent the RAF had to shoulder blame, because the flow of replacement aircraft was not up to expectations, and because of an epidemic of engine failures (due to the use of the wrong type of oil) that put many transports out of commission. However, as might be expected, weather was the dominant influence in limiting the delivery of supplies. The rains not only turned back flights and made landing fields in Burma unserviceable; frequently the supposedly all-weather base on Ramree Island was so waterlogged that transports were unable to take off. Finally, during June, 232 Group lost 12 transports to bad weather, compounding the difficulties already encountered with maintenance and the shortage of replacement aircraft.

July was a more satisfactory month. The ground forces were finally able to evacuate surplus troops through the port of Rangoon, aircrews had become more experienced in monsoon flying, and drainage of Ramree Airfield had been improved. Use of a different type of oil reduced the incidence of engine failure. Improvements in the port facilities of Rangoon and the communications radiating out from that city lessened the demands for air supply. Specific figures on ground force requests and air force deliveries are not available, but in the absence of complaints from ground headquarters, it may be assumed that the needs of the ground troops were satisfied.

When the Japanese Twenty-eighth Army made its expected attempt to break across the railroad corridor and the Sittang River, there was a flurry of emergency airdrops to isolated Allied units. The Battle of Sittang Bend was an outstanding example of Japanese valor in a war that furnished many such examples. Approximately 23,000 men were under Twenty-eighth Army com-

mand. To reach friendly territory, these thousands must fight their way through the Allied units along the railroad corridor, then cross the monsoon-swollen torrent of the Sittang River.

In preparation, the Japanese troops were divided into parties of approximately 500 men each and assigned routes to follow. Each man carried two lengths of bamboo so that material for building rafts would be on hand at the river. This was a desperate venture at best (though necessary for an army that would not surrender and that did not choose to starve), and any hope of complete success was lost when a copy of the operations order fell into Allied hands. Beginning on 20 July, the Japanese fought for two weeks, making little impression on the two British divisions in the corridor and encountering numerous ambushes by Burmese guerrillas. When the fighting ended, more than 6,000 Japanese dead had been counted; the flooded rice paddies and the Sittang River had claimed many more. Even so, some 13,000 men of the Twenty-eighth Army made their way to comparative safety across the river.

As 17 and 19 Divisions contested the Japanese in the corridor, many of their units were isolated and required supply by airdrop. Suitable DZ's were few in the paddy country during the monsoon; when first opened, they were hard to locate from the air, but after one drop they were well-marked by parachutes. Since the zones were small and often pressed closely by the Japanese, a high order of accuracy was necessary. Small arms fire scored many hits on RAF transports as they circled over the DZ's, but no aircraft were lost and the damage was seldom, if ever, serious.

The Battle of the Sittang Bend was the last major engagement of the war in Burma, and it was the last time that air supply was essential to the survival of Allied units in that theater. The transports of 232 Group continued to fly supply missions to Burma for many months after the end of the war, but as hostilities came to an end, air transport was once more becoming an adjunct to the surface supply lines. It had

ceased to be the only reliable connection between Allied ground and air forces in Burma and the rest of the Allied world.<sup>42</sup>

#### Administration of CCTF Air Supply

*Requirements and requests.* During the final campaign in Burma, air supply requirements were established by a system of give and take between army and air force headquarters. At the beginning of each month, divisions in Burma submitted their requirements for the following month to corps, and corps then submitted consolidated requirements to Fourteenth Army (or to ALFSEA in the case of XV Corps). Air units in central Burma submitted their supply requirements to 221 Group. The total army-air requirements were broken down into semimonthly periods for the month in question (1-15 March, 16-31 March, for example) and then the supplies available by surface means were subtracted from these totals. The amount of supplies remaining when surface transported goods had been subtracted was submitted to CCTF as a tentative air supply requirement.

CCTF calculated its capability on the basis of flying hours per month per authorized (not assigned) aircraft. The planning factors used included distance, airspeed, and pay load. Also, the amount of supply dropping required had to be taken into consideration, because the net tonnage delivered by airdrop per flying hour was less than that delivered by landing on forward airfields. If the army's forecast of requirements was within CCTF capabilities, it was accepted by CCTF and EAC and became a commitment. If, as was usually the case, the tentative requirements exceeded capability, the forecast was returned to the ground force headquarters for the assignment of priorities to the various desires of consuming units. The assignment of priorities amounted to reducing the requirements unless it should develop that CCTF capabilities increased beyond expectation during the period in question, or unless the army found that it did not need all the material to which high priority had been extended. The revised requirements state-

ment was then submitted to EAC and, when approved, became the CCTF task for the period in question. EAC could, and sometimes did, add other tasks.

On the basis of total tonnage allocated, corps headquarters and other ground force consumers submitted requests one week in advance for a week's supply of all items except ammunition. Normal ammunition requests were made 48 hours in advance, but emergency requests for ammunition or any other material could be made at any time; normally delivery of emergency items could be made within 24 hours of the receipt of the request. Aside from not exceeding the original allocation, the only restriction on requests was that maximum tonnages per day were fixed for various types of forward landing ground in Burma. Generally this maximum amounted to 400 long tons for a single strip, 800 long tons for a double strip,\* but if fighters were based on the strips concerned, the maximums were reduced to 200 and 500 long tons.

RAF 221 Group did not make its demands regularly a week in advance. As a result, CCTF was often embarrassed by a request for a large amount of air force supplies one day, an insignificant quantity the next. Such variations made it most difficult to make efficient use of the available aircraft, and it was strongly recommended that 221 Group follow the same request procedure that Fourteenth Army followed. However, as late as April 1945 this recommendation had not been adopted.

CCTF, like other air supply agencies, was plagued with requests for air supply of items not included in original tonnage allocations. Most such requests came from tactical air units. The order establishing CCTF had specified that all such additional demands be referred to EAC for approval, and CCTF ruthlessly complied with this order.

Because of weather, shortages of aircraft, maintenance difficulties, or the failure of the army to deliver material to air supply bases, CCTF sometimes failed to deliver all

\*See above, p. 102.

the supplies requested by ground units, even though the requests were within the tonnage commitments. Usually such deficiencies could be made up subsequently; sometimes they could not. In the case of rations, it was seldom necessary to make up deficiencies; troops who had been on half-rations for several days could not subsequently eat double rations and make up what they had missed. Sometimes, also, items desired by the ground forces for some particular purpose were no longer needed when the occasion for use had passed before delivery had been made.<sup>43</sup>

*Ground organization for air supply.* In preparation for the offensive of 1944-1945, ALFSEA established the Army Air Transport Organization (CAATO) on 17 October 1944.\* As established, CAATO consisted of a headquarters under Col. (later Brigadier) J. A. Dawson, and six Rear Airfield Maintenance Organizations (RAMO's). Two more RAMO's and three Forward Airfield Maintenance Organizations (FAMO's) were added later.† CAATO Headquarters was established at Comilla, adjacent to CCTF Headquarters.

The duty of CAATO Headquarters was to act as the agent of ALFSEA in all matters pertaining to air supply. It received forecasts of requirements from ground forces and tactical air groups (221 and 224 Groups) in the field, and in cooperation with CCTF correlated these forecasts with CCTF capability. If necessary, CAATO referred excessive requirements back to the consuming unit for correction. It was also the duty of CAATO to apportion tasks among the various RAMO's in accordance with the capabilities of the RAMO's, particularly with reference to the stocks held. In this same connection, CAATO translated the demands on each RAMO into commodities and submitted this commodity breakdown to the RAMO so that it could be

broken down further into planeloads in time for loading. Another, and major, task of CAATO was to make certain that all RAMO's held balanced and adequate stocks for the tasks they might be asked to perform. Finally, CAATO Headquarters was responsible for scheduling the fly-in of reinforcements and the fly-out of casualties, leave personnel, and units returning to India from Burma.

It is evident that CAATO could succeed to the extent that it was able to cooperate with CCTF and the transport units. Cooperation with CCTF was simplified by the proximity of the two headquarters at Comilla.

Cooperation with the operating air units was achieved by stationing army liaison officers at RAF wing, AAF group, and all squadron headquarters. These liaison officers were informed that their primary task was to get to know, and to obtain the confidence of, the personnel of the units to which they were attached. They were instructed to act as army staff officers for the unit commanders, and to keep the commanders informed concerning military developments in Burma. They were to seek information of use to the ground forces by interrogating aircrews on their return from missions, and they were to aid squadron intelligence officers in briefing crews. Finally, they were to maintain close liaison with the particular ground units the squadron, group, or wing was supporting. Air commanders noted that the efficient work of these army liaison officers was an important element in the cooperation between ground and air achieved in air supply operations.

The RAMO in CCTF operations was the equivalent of the Air Cargo Resupply Squadron in north Burma air supply operations,\* but rather than being an air force unit under ground control, the RAMO was a ground force organization administratively and operationally. The RAMO evolved as the need for it became obvious;

\*Presumably because most messages to AATO were addressed to the commander, the organization soon became known as CAATO, and was so referred to in official CCTF and ALFSEA documents. In this account, the more widely used and understood abbreviation, CAATO, will be used to designate the organization. Field Marshal Sir William Slim, in his *Defeat into Victory* (London, 1956), p. 386, refers to CAATO as the Combined Army Air Transport Organization, but he is alone in the use of this designation.

†See below, pp. 125-28.

\*See above, p. 41.